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AN ANALYSIS OF THE PROPENSITY FOR
NONTRADITIONAL OCCUPATIONS AMONG CIVILIAN
AND NAVY WOMEN

by

Marshall B. Brown

September 1993

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19 Abstract
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by

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I. INTRODUCTION

A. BACKGROUND

On April 28, 1993 Secretary of Defense, Les Aspin, announced that he will ask Congress to repeal the law barring women from Navy combat ships. Aspin commented: "We need to recruit the best talent available. Right now we are not able to do that because many jobs are closed to women." Aspin further stated: "We need to draw from the largest available talent and select the most qualified individual for each military job." (Matthews, 1993)

At the time of these announcements, 28 Navy enlisted ratings were closed to women. The week before Aspin's announcement, Vice Admiral Ronald J. Zlatoper, Chief of Naval Personnel, stated: "Within five years, I think we're going to be a gender-neutral navy." (Pexton, 1993) A gender-neutral Navy will not have barriers preventing women from entering certain enlisted ratings. For women to be fully assimilated into the Navy, increasing numbers of them will need to enter traditionally male occupations.

On May 24, 1993 the Navy unilaterally took additional steps to aid the assimilation of women into traditionally male occupations. Though the combat exclusion laws were not yet lifted, six formerly all-male enlisted ratings were opened to

women. The ratings opened were: Aviation Antisubmarine Warfare Operator, Electronic Warfare Technician, Fire Controlman, and Gas Turbine Systems Technician (general, electrical, mechanical). These six ratings are technical or mechanical in nature. They are also far removed from the administrative ratings women traditionally have been crowded into (Burlage, 1993). The six new nontraditional ratings were made available because Secretary Aspin endorsed a Navy plan to permit women aboard four additional classes of ships. The new classes of ships open new advancement avenues to women.

CAPT Ron Peterman, director of enlisted plans for the Bureau of Naval Personnel (BUPERS) stated: "The key to opening a rating to women is that there must be career progression through master chief petty officer." (Burlage, 1993) Allowing women to go to sea in a rating makes the necessary career progression possible.

LCDR George Coleman, a BUPERS personnel planner, stressed that women must first agree to enter the newly-opened skills, either as new recruits or as transfers from the most overcrowded skills (Burlage, 1993). Another BUPERS manpower planner is quoted as saying, "The question is, will women want to enter those ratings? Will they make the grade?" (Burlage, 1993)

In the context of Secretary Aspin's announcement, the Navy faces some important questions: When there are no longer any combat exclusion barriers, how many women will gravitate into

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sea-intensive nontraditional ratings? Will more recruiting dollars be required to attract women into training for these ratings? Will financial inducements be required to entice females to enlist for nontraditional jobs? Or, will it be necessary to assign males and females to ratings to achieve a "balanced" distribution?

This thesis will explore women's propensity to select nontraditional occupations. Specifically, it will analyze the "desired" occupations of a sample of civilians of enlistment age and a sample of Navy enlistees. The thesis will try to determine if overall occupational preferences differ between civilians and military enlistees and, specifically, whether preferences for nontraditional and traditional occupations differ. Also, it will attempt to identify what demographic and background factors appear to affect differences in occupational preferences between the groups. Finally, within the civilian and navy enlisted groups, the thesis will analyze differences in the occupational preferences of males and females.

Throughout this study the term "nontraditional female occupation" will be used to signify jobs that women do not usually fill. Using females as the referent, nontraditional occupations can be thought of as jobs that are usually filled by men.

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B. OBJECTIVES

This thesis is an exploration of women's stated occupational preferences. This thorough investigation of taste and preference may help point the way for future manpower policy. If increasing numbers of women express a preference for nontraditional occupations, the Navy will probably have no problem filling the billets that are rapidly being opened. If, on the other hand, women's preferences for nontraditional occupations are unchanging or decreasing, special efforts may be needed to induce women to enter the additional nontraditional billets being opened to them.

Joining the military may itself be considered a nontraditional choice for women, regardless of how traditional the ratings they tend to enter. This dual choice is examined in the primary research question of this study:

1. Is there a difference in "desired" occupation between civilian women and young female enlistees?

The secondary research questions include:

2. Is there a difference in occupational preferences between male and female civilians and male and female enlisted personnel?

3. What factors affect occupational choice and how does the effect of these factors differ across gender and sector?

4. Is the civilian world a good place to get clues on whether women will want to enter nontraditional occupations in the navy?

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C. SCOPE, LIMITATIONS, AND ASSUMPTIONS

This thesis will utilize information available in two data sets: the 1979 and 1982 panels of the National Longitudinal Survey of Youth (NLSY) and the Navy's 1991 New Recruit Survey (NRS). The 1979 and 1982 NLSY panels asked respondents; "What is your desired occupation at age 35?" The data set includes only enlistment age youth, those who were 17 to 21 years old during the two panels. This data set should accurately reflect propensity for civilian youth. It will not reflect, however, whether the respondents are qualified for the jobs they desire.

The 1991 NRS asks enlistees to indicate their preferences for Navy ratings as well as their future civilian job interests. These data should accurately reflect propensity and indicate differences or similarities between rating and civilian job interests.

When the Navy's combat exclusion laws are lifted, career options for enlisted women will be considerably broadened. Women's answers to the desired rating question on the NRS may provide one indicator of their actions in an unconstrained environment.

It is recognized that preferences change over time. Longitudinal data from the U.S. Census Bureau also will be analyzed in the literature review to illustrate trends in women's occupational choices that have occurred over time.

A very important aspect of this analysis will be the definition of nontraditional female rating and occupation. In this thesis females will be the reference group. The study will utilize the division between traditional and nontraditional ratings presented in a study by Thomas (1982). Thomas' classification of DOD jobs and Navy ratings is presented in Appendix A.

Nontraditional female civilian occupations will be identified based on the proportion of women in that career field in a base year. Since the earliest data available for this thesis are drawn from 1979, this will constitute the base year. Any occupation composed of less than 25 percent women in the 1979 census data will be classified as nontraditional. This listing of civilian occupations labeled traditional and nontraditional is presented in Appendix B. The 25 percent criteria for declaring a job nontraditional is derived from an earlier study (Waite and Berryman, 1985).

D. ORGANIZATION OF THE STUDY

This study is organized into five chapters. Following the introductory information and background contained in Chapter I, Chapter II reviews numerous studies germane to this topic. Women in nontraditional occupations have been examined from psychological, sociological, economic and statistical perspectives. Chapter III gives a detailed explanation of the estimating models that will be utilized in the NRS analysis

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and explains how these models will be used to answer the research questions. The statisitical results of the NRS analysis are then presented and interepreted. Chapter IV gives a detailed explaination of the estimating models that will be utilized in the NLSY analysis and explains how these models will be used to answer the research questions. The statistical results of the NLSY analysis are then presented and interpreted. Finally, Chapter V presents conclusions based on the statistical analysis and recommendations for fully assimilating women into the gender-neutral Navy.

II. LITERATURE REVIEW

The topics "women in nontraditional occupations" and "propensity to enlist in the military" have been researched extensively. Several studies on this subject exist with nearly identical titles, but they encompass radically different approaches. This thesis will examine past studies that have used psychological, sociological, economic, and statistical perspectives. Though none of the studies reviewed compared propensity for nontraditional occupations between civilians and Navy (or military) enlistees, the methodologies used and conclusions drawn suggest a logical framework for the analysis in this thesis.

A. STUDIES FROM A PSYCHOLOGY PERSPECTIVE

The first study reviewed is an examination of women's motivations for enlisting in the military using a psychology perspective (Thomas, 1977). Thomas obtained data on the demographic characteristics and work values of Navy enlistees, and tried to determine whether differences in characteristics between male and female enlistees were significant. She hypothesized that no significant differences between men and women would be found. Thomas' analysis utilizes an experimental questionnaire administered to male and female Navy enlistees. The responses of men and women to 81

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questions concerning personal history, motivation for enlisting, and occupational values were analyzed. Approximately 1,000 female recruits and 1,041 men were tested.

Her analysis indicates that significant differences between male and female enlistees do exist. The occupational values most heavily endorsed by women in the study include: "provides a cheerful, clean work environment," and "requires contact with a lot of people during the day." The occupational values men more heavily endorsed include: "provides opportunity to advance to supervisory position," and "includes working outdoors" (Thomas, 1977). The author asserts that the values favored by the Navy women in her sample indicate that these women have occupational values consistent with traditional female jobs. She also points out that the majority of Navy enlisted ratings are nontraditional female occupations (Thomas, 1977).

Thomas concludes with the hope that women with occupational values consistent with nontraditional ratings can be recruited in the future. She recommends that Navy recruiting advertisements be revised to show females functioning in nontraditional jobs (Thomas, 1977).

The second study reviewed is a comparison of satisfaction, attrition, and reenlistment for women in traditional and nontraditional jobs (Thomas, et al., 1982). In this study the authors examine the effects of gender appropriateness of job assignment on Navy women's attitudes and behaviors. This

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study also analyzes the effects of working in male-dominated workgroups on Navy women. The sample for the study consisted of 979 women and 1,011 men who entered recruit training in 1975. Over the next five years numerous questionnaires were administered to this sample in order to construct a single longitudinal data bank. Data analyzed in this study came from respondents in their third or fourth year of service.

An interesting portion of this study examines women's expectations of the Navy. Only 19 percent of the women in nontraditional jobs stated that the Navy met their expectations. Conversely, 38 percent of the women in traditional jobs felt that their expectations had been met (Thomas, et al., 1982, p.9). This supports the belief that women enlist expecting to work in traditional female occupations.

Another relevant portion of the analysis dealt with femininity. The questionnaire asked: "Do you place a high value on being, looking, and acting feminine?" More women in traditional than in nontraditional occupations answered "yes" to this question, and the difference was statistically significant. (Thomas, et al., 1982, p.9) It is not clear whether this stated desire for femininity channels women into traditional jobs, or whether occupying a nontraditional job induces a woman to discount her otherwise normal preference for "femininity."

Analyses of satisfaction, expectations, advancement, and reenlistment intention were conducted for women in three separate types of workgroups. These workgroups were described as male-dominated, balanced or female-dominated. Workgroup composition was found to have no significant influence on how women responded to the three variables mentioned above. Surprisingly, women working in male-dominated nontraditional fields felt much the same about their work as their counterparts in more traditional fields. (Thomas, et al., 1982)

This study indicates that working in a nontraditional rating has no significant effect on a woman's satisfaction, advancement, attrition or reenlistment. The authors do conclude, however, that the Navy should attempt to attract a different kind of woman:

> Women who enlist in the Navy hold traditionally feminine work values, although the Navy needs a different kind of woman--one who wants to work with machinery or deal with data, rather than solely with people. (Thomas, et al., 1982, p.19)

A third study attempted to isolate the differences between Navy enlisted women in traditional and nontraditional jobs (Hinsdale, Collier, and Johnson, 1978). This study utilized a questionnaire designed to identify personality traits of female petty officers third class (paygrade E4) and second class (paygrade E5). These paygrades were chosen because they are comprised of women who have spent several years in the Navy, forming realistic perceptions and expectations. The

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instrument, known as the Bem Sex Role Inventory (BSRI), was administered to 133 women.

Self-reported personality characteristics showed some interesting differences between women in traditional and nontraditional occupations. A comparison of means indicates that women in nontraditional jobs consider themselves more "individualistic" than their counterparts in traditional jobs. The BSRI categorizes individualistic as a masculine trait. Women in traditional jobs consider themselves more "gentle" and "feminine" than their counterparts in nontraditional jobs consider themselves. The BSRI categorizes these traits as feminine. The differences are significant at the five percent level (Hinsdale, Collier, and Johnson, 1978). These findings, similar to those of Thomas (1982), indicate that women in nontraditional occupations feel they possess masculine traits. The authors did not discuss whether these masculine traits were pre-existing, or a result of working in the nontraditional occupation.

An ordinary least squares (OLS) estimation of the determinants of job satisfaction is also illuminating. The masculine BSRI personality traits, "competitive," "individualistic," "assertive," and "athletic" are all positively correlated to job satisfaction for women in nontraditional jobs. These correlations are significant at the five percent level. No feminine BSRI personality traits are statistically significant and positively correlated with

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job satisfaction in nontraditional jobs. These findings are further indication that women who feel they possess masculine traits are happier in nontraditional jobs than women who consider themselves non-masculine (Hinsdale, Collier, and Johnson, 1978, p.10).

This study concluded with the recommendation that screening procedures be initiated to identify the personality traits of new enlistees. Women possessing masculine personality traits should be assigned to nontraditional jobs. The authors did not discuss, however, whether the masculine traits reportedly possessed by females in nontraditional occupations are acquired, or are present prior to enlistment. That is, the assignment of women to nontraditional jobs may influence their self-reporting of traits.

A fourth study examines data concerning women's propensity to enlist in the military obtained from three separate sources; the Youth Attitude Tracking Survey (YATS), the National Longitudinal Study of Youth (NLSY), and High School and Beyond (HSB) (Kiplinger, Boesel, and Johnson, 1985). YATS utilizes a composite measure of propensity to enlist. Each respondent is asked: "How likely is it that you will be serving on active duty in the Navy? (Air Force, etc.)" Possible responses include: "definitely, probably, probably not, or definitely not." (Kiplinger, Boesel, and Johnson, 1985). Respondents who answer "definitely" or "probably" to at least one of the service choices are considered to have a

positive propensity to enlist. The 1980-1989 panels of YATS
were examined, with the results for propensity to enlist in
the Navy presented in Table 1. YATS indicates that men are
significantly more likely than women to have a positive
propensity to enlist in the military (Kiplinger, Boesel, and
Johnson, 1985).

TABLE 1.

**POSITVE PROPENSITY TO ENLIST IN THE
NAVY, BY GENDER (PERCENT)**

YEAR	FEMALES	MALES
1980	6.6	14.4
1981	7.1	15.4
1982	5.6	14.4
1983	4.7	13.0
1984	4.3	10.9
1985	4.4	10.6
1986	4.1	11.1
1987	5.3	12.3
1988	4.6	12.3
1989	5.0	13.1

Source: YATS 1980-1989

The study further indicates that, though male propensity
is higher, some propensity patterns among subgroups are very
similar for the two genders. For example, among both males
and females, the proportion of 16 year-olds reporting positive

propensity is significantly higher than it is for 21 year-olds. The propensity to enlist declines with age uniformly for males and females.

This study also presents some important gender-related differences in propensities and subsequent enlistment decisions. All three data sources indicate that women are less interested than men in military service. The data also indicate that, among women interested in the military, there is a tendency to regard it as a complement to other activities, rather than as a career (Kiplinger, Boesel, and Johnson, 1985). An example of this is the high propensity women show for service in the reserves, condidering military service a complement to, rather than a substitute for, obtaining a college education.

The final study that uses a psychology perspective deals with gender differences in promotion opportunities (Markham, South, Bonjean, and Corder, 1985). This study models females' opportunities for promotion, based on self-reported attributes. The authors find that women are concentrated in lower level career ladders than men, but that these ladders offer the same promotion opportunities as the male-dominated career ladders. One finding of interest is a stronger desire among women than men for security and interpersonal support in the workplace. This finding agrees with Thomas (1977), who asserts that women possess different occupational values than men.

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B. STUDIES FROM A SOCIOLOGY PERSPECTIVE

The first study that uses a sociology perspective examines occupational segregation in both the civilian world and in the military (Firestone, 1992). Firestone compares the differential location of women and men in the labor force, attempting to determine whether women are proportionally represented in all occupations. She makes the assumption that, if no sex segregation existed, the proportion of women in any occupational category would equal the percentage of women in the labor force.

The civilian occupational data used in this study are taken from the 1988 General Social Survey. Only respondents over 18 years of age and employed full-time are used. The total civilian sample size is 249. The military sample consists of all active-duty officers and enlisted personnel in the Department of Defense as of March 1989. (Firestone, 1992)

Firestone hypothesizes that sex segregation exists both in the military and the civilian labor force. The purpose of the study is to quantify the amount of occupational segregation present, and make comparisons among the armed services and with the civilian labor force. The author utilizes O.D. Duncan's occupational segregation index to make these comparisons. The index is calculated as follows:

$$S = 1/2 \sum |M_i - F_i|$$

where,
Mi = proportion of occupation *i* labor force that is male, and

Fi = proportion of occupation *i* labor force that is female.

Duncan's index indicates the percentage of men (or women) who would be forced to change jobs in order to duplicate the occupational distribution of the other group. Firestone used the DoD occupation codes from the *Occupational Conversion Manual* to create comparable categories for the military and civilian samples. Using the ten DoD occupation categories as a base, 13 civilian classifications were created, ten of which could be directly compared to the military categories. Because of structural differences between officer and enlisted military occupations, they cannot be analyzed together. All civilians holding at least a baccalaureate degree are compared to military officers in the analysis. All civilians with less than a baccalaureate degree are compared to enlisted military personnel. (Firestone, 1992)

Among Navy enlisted occupational categories, Duncan's index indicates that 28 percent of the men or women in the Navy would have to change jobs in order to achieve an equitable distribution across categories. In a corresponding civilian sample, 48 percent of the men or women would be forced to change jobs to achieve an even distribution across occupations (Firestone, 1992). This indicates that the Navy leads the civilian sector in degree of gender integration into nontraditional fields. The author attributes the Navy's

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apparent success to the following reasons: First, the Navy has encouraged women to enter nontraditional technical ratings because it cannot compete with civilian salaries for white men in these occupations. Second, the Navy has been able to foresee demographic shifts. A future shortage of qualified men would dictate an even more thorough assimilation of women into all Navy ratings.(Firestone, 1992)

Duncan's index scores for each military service's enlisted occupational distribution and the corresponding civilian scores are presented in Table 2. These scores indicate that the Navy leads the other services in degree of gender integration, but all military services lead the civilian sector.

TABLE 2.

**OCCUPATIONAL SEGREGATION INDEX SCORES
BY SERVICE**

SERVICE	OCCUPATIONAL SEGREGATION INDEX
NAVY	28.45
AIR FORCE	35.45
MARINE CORPS	37.10
ARMY	39.80
CIVILIAN WORK FORCE	48.85

Source: Defense Manpower Data Center

Of course, the large supply of eligible females, coupled with small demand, explains some of the Navy's success in equalizing the occupational distribution. Women line up to enter the military, and many eventually enter male-dominated military occupations because nothing else is offered to them. Waite and Berryman (1986) describe the process through which many women choose nontraditional military occupations:

> Women clearly queue up for jobs in traditionally female occupations in the military, strongly suggesting that they prefer those jobs, at least on the basis of the information that they have at enlistment. Recruiters therefore have to sell some fraction of women enlistees on nontraditional occupations. (Waite, and Berryman, 1986, p.2)

Firestone concludes with the assertion that the Navy's successes in occupational distribution compared to the civilian labor force may not be worthy of praise. "The civilian labor force has shown remarkably stable occupational segregation through the past 30 years." (Firestone, 1992, p.378)

One problem with Firestone's research is that the civilian sample is much too small for conducting a meaningful comparative analysis. The comparisons among the military services appear valid, but any conclusions reached using military to civilian comparisons are suspect because the civilian sample is unlikely to be representative.

A second sociology study reviewed examines long-term trends in sex segregation from the year 1900 (Jacobs, 1989). The author specifically addresses the inconsistencies in

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occupational coding that plague many longitudinal studies of this type. This study is relevant because long-term trends in female occupational choice may be a good indicator of female propensity.

Jacobs utilizes data from the 1900 and 1910 Public Use Sample in his analysis. He uses census data from 1970 and 1980 as well as the 1986 Current Population Survey (CPS) to complete his sample. The author applied the 1910, 1950, and 1980 occupational codes to the 1900 data to resolve problems with classification inconsistencies. He finds that the measures of comparative sex segregation derived differed only slightly when alternate coding schemes were used. Jacobs also determines that agricultural categories were too broad for accurate measurement, leading him to present results for both the labor force and the nonfarm labor force.

In Jacob's study the amount of sex segregation present is quantified with the index of dissimilarity, similar to O.D. Duncan's index used by Firestone (1992). The index of dissimilarity indicates the proportion of women who would have to change occupations in order to be distributed in the same proportion as men (Jacobs, 1989, p.166).

Jacobs' results support the structuralist theory to some extent. The theory argues that sex-segregation is an intentional result of a male-dominated labor market intent on preserving patriarchy. He noted that there was a seven percent decline in the index of dissimilarity between 1910 and

1970, followed by another seven percent decline between 1970 and 1980 (Jacobs, 1989). Structuralists use the relative stagnation between 1910 and 1970 to support their arguments; but since 1970 conditions have changed dramatically. "In short, the glacial pace of change in sex segregation through 1970 has given way to modest but consistent change since that time." (Jacobs, 1989, p.171) The consistent decline in sex segregation noted by Jacobs has accelerated since 1970. This may be linked to an increase in women's propensity to enter the formerly male-dominated, nontraditional jobs.

C. STUDIES FROM AN ECONOMIC PERSPECTIVE

Human capital is the accumulated investments a worker makes in education, training, migration, and job hunting throughout his life. The human capital model postulates that workers accumulate education and job training as a long-term investment, expecting to be better off as a result (Ehrenberg, and Smith, 1991). Traditionally, women have intermittently left the job market in order to marry, have children, and raise families. Due to interrupted labor force participation, the value of human capital investments erodes quickly in highly technical fields such as engineering. Women who expect no interruptions in their labor market participation may make heavier investments in human capital than their more traditional counterparts (Ehrenberg, and Smith, 1991).

The human capital model may help explain the decrease in sex segregation over time noted by Jacobs (1989). The availability of high wages in nontraditional jobs should lead more women into the labor force, also inducing them to stay there for longer periods of time. They will then invest more heavily in labor-market skills, and in turn, make occupational choices more consistent with those made by men (Jacobs, 1989). Decreasing sex segregation is important because it may help eliminate the pay disparity that exists between men and women, even when human capital factors are controlled (Berryman, 1978).

When studying women's choices, it is imperative that the differences between men and women be remembered. Berryman (1978, p.17) claims that occupation centrally defines lifestyle for men, but not for women. She describes the female occupational choice as follows:

> Unlike men, then, they do not choose an occupation per se. They choose flexibility to juggle marriage, work, possibly children. They choose how much work, at what times in their lives, and with how much involvement. They choose jobs and assume roles in work groups that enhance their chances of getting or remaining married.

Kiplinger's (1985) finding that many women regard the military as a complement to other activities, such as raising a family, lends credence to Berryman's statement. An important determinant of propensity for nontraditional occupations may well be the permanence with which a woman considers her labor force participation.

Waite and Berryman's (1986) study on job stability in traditional and nontraditional occupations is also important. The authors hypothesize that the more nontraditional the occupation, the greater the probability of turnover among women. The supporting arguments for this hypothesis are discussed below.

The first reason for high turnover among women in nontraditional occupations is due to the fact that they know very little about those jobs and have few related skills. "For example, when educational attainment is held constant, women applicants to the military score significantly less well than their male counterparts on tests of electronic and mechanical knowledge." (Waite, and Berryman, 1986, p.4) The authors devised a scale of knowledge of traditionally male jobs ranging from zero (no knowledge) to four (full knowledge). "On this scale, males ages 14 to 17 scored 2.76 compared with 2.40 for their female counterparts." (Waite, and Berryman, 1986) This lack of knowledge about nontraditional occupations may be a key reason that women queue up for the traditional female ratings in the military.

A second reason for high turnover among women in nontraditional occupations is that they dislike certain characteristics of the job. This fact is pointed out in the following passage:

> Among high school seniors, the sexes differ substantially in the characteristics of jobs that they consider important; females rate helping others and working with

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people as much more important than do males, who rate making money and being a leader much more highly than do females. (Waite, and Berryman, 1986, p.5)

Identifying those females who value leadership positions may be another determinant of their propensity for nontraditional jobs.

The authors used a maximum likelihood estimate of turnover to compare women in traditional and nontraditional military jobs. Their findings indicate that military women are slightly less likely to leave traditional occupations, but this relationship is statistically weak. Turnover studies are relevant to this thesis mainly because they refute assertions that women should not be assigned to nontraditional jobs simply because they may drop out.

The final study reviewed from an economic perspective is Gupta's (1993) analysis of the characteristics of jobs held by men and women. Gupta models the occupational status of workers by the interaction of two distinct choices: a worker's choice of job and an employer's choice of that worker for that job. The author chose this two-tiered model in order to "...allow a separation of whether the occupational status of women is due to differences in preferences, or due to differences in hiring."(Gupta, 1993, p.57)

The sample used was derived from the 1982 NLSY, using only working civilians whose desired occupation from 1979 matched their reported occupation in 1982. The author also utilized a job attributes index, indicating the pleasantness of the

work environment for each particular job. For this index, jobs are rated based on safety, strength requirements, degree of stress, and other important factors. The index values range from one to five, with five indicating a very pleasant work environment. The author also divided the sample into four occupational groupings: female, professional, crafts, and service. An occupation was coded "female" if it was made up of at least 60 percent women (Gupta, 1993).

An analysis of means of the explanatory variables is instructive. The men in the sample have significantly higher hourly wages than the women. The women have a significantly higher index of job attributes than the men. The "female" occupations have the lowest hourly wage and the highest index of job attributes of the four occupational classifications. These findings indicate that the women in this sample receive lower wages than the men, but enjoy better working conditions.

Gupta's model uses a worker's utility function to estimate the probability that he or she will choose one of the four occupational groups, and that an employer in that occupational group will hire that worker. His findings include:

1. Women are more likely than men to choose and enter the lower paying "female" occupations;

2. Women are less likely than men to be hired into the professional and service occupations. (Gupta, 1993, p.60)

Gupta's findings support earlier findings that women place a premium on a pleasant work environment. However, employer

preferences also lead many women to settle for lower paying female occupations.

D. STUDIES FROM A STATISTICAL PERSPECTIVE

The first study written from a statistical perspective reviewed is Waite and Berryman's (1985) analysis of women in traditional and nontraditional occupations. The objective of the study is to identify factors that predispose young women to choose and remain in nontraditional female jobs in the military and in civilian firms. The authors hypothesize that women who envision themselves as long-term players in the business world will gravitate to traditionally male-dominated jobs. These jobs provide high pay, but they demand a high level of commitment to work. The authors feel that if the factors predisposing women to a long-term commitment to work can be isolated, certain women can be screened and actively recruited to fill nontraditional jobs (Waite, and Berryman, 1985).

The sample utilized in this study is the 1979 NLSY. Only males and females aged 14 to 17 years old are included in order to investigate the gender typicality of initial occupational expectations. It is recognized that the youth in the sample lack labor market experience, but their stated preferences should indicate their propensity for certain occupations.

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The study uses a maximum likelihood estimation technique to model the determinants of choosing a nontraditional female occupation. The authors coded an occupation "nontraditional" if the proportion of females in that field is less than 25 percent (Waite, and Berryman, 1985). The occupations used in this model are those respondents reported they would like to be in at age 35. The expectations reported by women in the sample may not be realized, but reported propensities should play a role in a woman's future investments in human capital.

Waite and Berryman's maximum likelihood model reinforces the study's central hypothesis: "Women who expect to allocate more time to the home are more likely to expect intermittent labor force participation and therefore select a typically female occupation." (Waite, and Berryman, 1985) Those variables found indicative of a desire for intermittent labor force participation should be particularly relevant to this thesis.

Another relevant study is Filer's (1986) analysis of the role of personality and taste in determining occupational structure. The author discounts discrimination as being the major cause of sex segregation; instead he looks to differences in individual characteristics.

Filer's sample consists of 3,800 respondents who were given the Guilford-Zimmerman Temperament Survey (GZTS). This instrument measures personality traits, tastes, and preferences. The personality traits measured in the GZTS are

known to remain stable over time for a respondent (Filer, 1986). A weakness of the GZTS taste measures is the fact that many of them are reported after the respondent has made an occupational choice. The answers given may be influenced by exposure to an occupation, rather than merely stating taste.

The author uses a multivariate regression model to estimate the probability of entering one of five occupational classifications. The first model to be estimated uses only demographic factors as explanatory variables. The second model uses both demographics and personal preference measures. The model using only demographic independent variables correctly predicts occupational grouping 40 percent of the time. The second model accurately predicts 46 percent of the time, indicating that the use of personal preference enhances the predictive accuracy of the model.

The small proportion of women in nontraditional female occupations may be due to the fact that women do not have preferences and tastes that correspond to the conditions inherent in such jobs (Filer, 1986). When personal preference variables are added to an occupational choice model, the size of the negative effect of being female on the probability of choosing a nontraditional occupation is considerably reduced. This large impact indicates that the personal preference explanatory variables, omitted in the first model, are highly correlated with sex of the respondent. Filer's findings once

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again reinforce the importance of analyzing both demographic and preference variables in this thesis.

Kiplinger, Boesel, and Johnson's (1985) study contains some relevant statistics on the public perception of women in nontraditional jobs. A 1982 survey, using a representative sample of American adults, by the University of Chicago's National Opinion Research Center indicates support for women in the military. Survey findings indicate a " ...national consensus on extensive participation by women in military roles well beyond the traditional ones of nursing and clerical work." (Kiplinger, Boesel, and Johnson, 1985, p.11) Specific findings of the survey include:

> It was found that 84 percent approved of assignment of women as military truck mechanics, 73 percent as jet transport pilots, 62 percent as jet fighter pilots, 59 percent as missile gunners in the U.S., 59 percent as commanders of large bases, 57 percent as crew members on combat ships, and 35 percent as soldiers in hand-to-hand combat. (Kiplinger, Boesel, and Johnson, 1985, p.11)

This strong support for military women in nontraditional jobs has not been mirrored by strong increases in the proportions of civilian women entering nontraditional occupations. Table 3 reflects the proportion of civilian women employed in nontraditional occupations over a nine year period, which has been relatively stable. This could indicate that women's propensity for nontraditional jobs over the years 1983 through 1991 has been static. Of course, demand for women in nontraditional civilian occupations may be flat, preventing

women from having the opportunity to increase their representation in those fields.

TABLE 3.

PERCENTAGE OF CIVILIAN WOMEN
IN NONTRADITIONAL OCCUPATIONS, BY YEAR

YEAR	PERCENT WOMEN
1983	6.4
1984	6.5
1985	6.4
1986	6.4
1987	6.3
1988	6.4
1989	6.4
1990	6.1
1991	6.1

Source: U.S. Census Bureau

The studies reviewed here have suggested several important determinants of women's occupational choice. Though the studies differ in objectives and approaches, they uniformly find that the attributes that women bring to the labor market are not identical to those brought by men. When demographic variables are controlled for, the literature indicates that women are less likely than men to enter nontraditional occupations.

This thesis will utilize some of the methodologies discussed in the literature to determine if there are differences in the propensities of civilian and Navy women to enter nontraditional civilian and military occupations. The differences between male and female civilians and male and female enlistees will also be explored. The logit estimating technique used extensively to model determinants of occupational choice by prior studies will be used in this thesis. To model the probability of entering nontraditional occupations, this thesis will apply the successful methodologies discussed in the literature to combine women's preferences with relevant demographic variables.

III. NRS DATA, METHODOLOGY, AND RESULTS

This chapter discusses the data sets used to analyze the propensity for nontraditional occupations among Navy women. The first section of this chapter describes the Navy New Recruit Survey (NRS) data set in detail. The second section outlines the methodologies employed to differentiate traditional from nontraditional occupations and models the determinants of occupational choice for men and women. The third section presents the results of a multivariate analysis of the determinants of nontraditional Navy rating and nontraditional civilian occupational choice.

A. NEW RECRUIT SURVEY DATA

The first source of data used in this thesis is the Navy Personnel Research and Development Center's (NPRDC) New Recruit Survey. The NRS was administered to Navy recruits undergoing basic training at the Recruit Training Centers in Great Lakes, Orlando, and San Diego. The data set was collected over three separate periods: Summer 1990, Winter 1990/1991, and Summer 1991. The semi-annual samples of 1800 recruits were asked 118 questions intended to gauge the effectiveness of recruiting incentives and advertising. The survey also asked for each recruit's social security number, allowing NPRDC personnel to merge the NRS with other Navy

training files to provide some demographic information. The
main survey questions pertaining to this thesis asked the
respondent's Navy rating preference and civilian job type
interest. A recruit's responses to these specific questions
should accurately represent his or her interest in certain job
types. Table 4 displays five broad categories of variables
developed from the NRS. These broad categories and the
variables associated with them are utilized in the statistical
analyses presented later.

TABLE 4. BROAD CATEGORIES OF VARIABLES FROM THE NRS.

OCCUPATIONAL PREFERENCES

--**Preferred Navy Rating**
--**Preferred Civilian Job Type**

PERSONAL DEMOGRAPHICS

--**Gender, Age, Racial/Ethnic Group**

ABILITY MEASURES

--**Armed Forces Qualification Test Scores**

COMMITMENT TO LABOR FORCE

--**Navy Program Enlisted For**

ENLISTMENT MOTIVES

--**High Tech Training, Navy Career, Support Dependents,
Money for School, Leadership Opportunities**

As shown in Table 4, there are five broad categories of
NRS variables used in this thesis. The first category

concerns the occupational preferences stated by Navy recruits. Question #143 of the NRS asks respondents to mark their Navy rating preference based on their estimate of their ability to complete the required training for that rating. Answers to this question indicate the respondent's propensity for a certain job type. This indication of interest is not dependent on the actual rating attained or sought. The Navy ratings from which a recruit could choose are listed in Appendix A.

Question #145 of the NRS asks the respondent to mark civilian job type interest based on the recruit's estimation of his or her ability to enter and complete necessary training for that job. Answers to this question indicate the respondent's civilian labor market propensity. The 19 civilian job types from which NRS respondents were asked to choose are listed in appendix C.

A Navy enlistee's response to these occupational preference questions is categorized as a "traditional" or "nontraditional" female occupational choice. The likelihood of a Navy enlistee making a nontraditional career choice is then used as the dependent variable for the multivariate analyses in this thesis. The methodologies employed to code each civilian and Navy occupation "traditional" or "nontraditional" are discussed in a later section of this chapter.

The second broad category of NRS variables represents personal demographics variables. A respondent's gender, age,

and racial or ethnic group are obtained from Navy training files and matched with the social security number reported in the NRS. Age is a continuous variable, with Navy recruits in the sample ranging in age from 17 to 34 years old. The racial/ethnic group variable is broken into four categories: White, Black, Hispanic, and Other Race.

The ability measure used in the NRS data is based on the Armed Forces Qualification Test (AFQT) score. AFQT score is computed from subtests of the Armed Services Vocational Aptitude Battery (ASVAB). The Navy uses AFQT scores as a general measure of mental ability.

Proxy measures of commitment to the labor force are based on questions in the NRS describing the program for which a Navy recruit enlisted. Realizing that differing enlistment contracts signal differing expectations of the Navy, enlistment program was broken down into the following four categories: (1) Reserve; (2) A-School; (3) Six Year Obligation; and (4) Four Year General Detachment. Reserve programs have short (less than four year) active duty service obligations and reserve commitments. Six Year Obligation programs include guaranteed schooling in a highly technical field after recruit training, but require six years of obligated service. A-School programs include guaranteed schooling after recruit training, but not to the same degree as Six Year Obligation programs. A-School programs require four years of obligated service. General detachment enlistees

enter one of the Navy's four general apprenticeships and are offered no additional schooling after recruit training.

Questions #26 and #27 in the NRS are used to determine the enlistment motives for Navy recruits. Question #26 asks for the respondent's "most important reason" for enlisting. Question #27 asks for the respondent's "second most important reason" for enlisting. Enlistment motives are broken into the following categories: "High Tech Training," "Money for School," "To Support Dependents," "For a Navy Career," or "For Leadership Opportunities."

B. STATISTICAL METHODOLOGY USING NEW RECRUIT SURVEY

The New Recruit Survey (NRS) data in this thesis are used to model the determinants of nontraditional occupational choice for male and female Navy recruits. This section describes how the two occupational preference variables are coded "traditional" or "nontraditional" female occupations. This section also describes the modeling methodology used to estimate the determinants of a preferred nontraditional Navy rating, or preferred civilian job type.

Question #143 of the NRS asks Navy recruits to state their rating preferences. There are 82 Navy ratings listed in the survey, alongside comparable civilian job types. The 17 ratings considered traditional for women by Thomas (1982) are coded "traditional" in this thesis. The traditional female Navy ratings are concentrated in the Functional Support,

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Medical/Dental and Service/Supply DoD occupational groupings. The entire breakdown of traditional and nontraditional Navy ratings is included in Appendix A.

Question #145 of the NRS asks Navy recruits to state their civilian job type preference. There are 19 civilian job types listed, along with examples of specific jobs of each type. Using Waite and Berryman's (1985) methodology, any civilian occupation with a work force less than or equal to 25 percent female is considered "nontraditional" for women. Of the 19 civilian job types listed in the NRS, nine are coded "nontraditional" and the remaining 12 are coded "traditional." Appendix C lists all 19 civilian job types. The proportion of females in the work force for each occupation was determined using census data for the year 1991 (U.S. Census Bureau).

Table 5 introduces the methodologies for two models of the determinants of nontraditional occupational choice, using non-linear logit models. The models' dependent variables, NTRADMIL and NTRADCIV, are binomial. The dependent variables are defined in this manner because the determinants of nontraditional choices are most relevant to Navy manpower planners. The maximum likelihood technique is used in these estimations because it is appropriate for modeling binomial dependent variables (Studenmund, 1992).

TABLE 5. MODELING METHODOLOGIES USING NRS DATA.

Two logit models of nontraditional occupational choice are estimated with maximum likelihood techniques:

1. NTRADMIL = f (DEMOG, ABILITY, COMMITMENT, MOTIVES)

2. NTRADCIV = f (DEMOG, ABILITY, COMMITMENT, MOTIVES)

Where,

NTRADMIL = preference for a nontraditional Navy rating

NTRADCIV = preference for a nontraditional civilian job

DEMOG = personal demographic variables

ABILITY = ability measures

COMMITMENT = commitment to labor force participation

MOTIVES = enlistment motives

The women in the NRS sample have already made one nontraditional occupational choice--they enlisted in the Navy. The models shown in Table 5 may reveal the determinants of a second nontraditional choice--propensity for a nontraditional rating or civilian job type.

Waite and Berryman's (1985) analysis of the determinants of nontraditional choice offers clues as to the specification of these models. Like Waite and Berryman, this thesis uses the limited demographic and ability variables in the NRS data to specify the model shown in Table 5. Preliminary analysis

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indicates that female Navy recruits exhibit little variance in age or ability, compared to the female population as a whole.

Waite and Berryman found that expected labor force participation is a significant factor in occupational choice for women. The NRS contains no questions regarding marriage intentions, or planned number of children. Instead, the Navy program enlisted for is used as an explanatory variable and as a proxy for labor force commitment in this model. Those respondents who enlisted for a highly technical program with a six year service obligation are making large human capital investments and signaling a commitment to uninterrupted participation in the labor force. Those respondents who enlisted for programs of shorter duration with reserve components are making fewer human capital investments and may be signaling an intention to leave the labor force in the foreseeable future.

Filer (1986) found that personality and taste may have a role in determining occupational structure. Filer found that women with tastes corresponding to the conditions found in nontraditional jobs were more likely to be found in those jobs than other women. Filer (1986) stated that tastes were often left out of estimations of the determinants of female occupational choice. The NRS question asking each respondent to identify his or her most important reason for enlisting does provide an indication of tastes. By including enlistment motives in the explanatory variables of this model, what a

woman considers important to her occupational choice can be gauged. Those women who joined the Navy to receive high-tech training are indicating a preference for working with machinery or electronic gear. These women can be expected to show a propensity for nontraditional jobs. The attitudes towards the labor force expressed by enlistment motive may provide valuable insight into a woman's work objectives.

C. NEW RECRUIT SURVEY RESULTS

This section presents the results of analyses conducted using NRS data. The first subsection presents the frequency distribution of dependent variables, providing an overview of the data. The second subsection includes descriptive statistics for the explanatory variables in the analyses. The concluding subsection presents the results of the multivariate analysis of the determinants of nontraditional occupational choice.

1. Frequency Distribution of Dependent Variables

Table 6 compares women in the New Recruit Survey (NRS) to women in the National Longitudinal Survey of Youth (NLSY). Compared to their 17 to 20 year old civilian counterparts, twice the proportion of female Navy recruits desire nontraditional civilian occupations. The differences in the two proportions are significant at the .01 level. This indicates that female Navy enlistees may systematically differ from similarly-aged civilian women in their attitudes toward

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the labor force. It also indicates that women who make one nontraditional choice, such as joining the Navy, are more likely to make other nontraditional choices.

TABLE 6.

PROPORTION OF FEMALE CIVILIANS AND FEMALE NAVY ENLISTEES DESIRING NONTRADITIONAL CIVILIAN OCCUPATIONS

SAMPLE	PERCENT NONTRADITIONAL
NAVY ENLISTEES[a]	41.4%
17-20 YEAR OLD CIVILIANS[b]	20.0

Source: a. NRS
         b. NLSY

TABLE 7.

PROPORTION OF NAVY ENLISTEES DESIRING NONTRADITIONAL NAVY RATINGS BY GENDER

GENDER	PERCENT NONTRADITIONAL
FEMALES	50.6%
MALES	78.8

Source: NRS

Table 7 compares propensity for nontraditional Navy ratings between male and female Navy enlistees. As expected,

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men are more likely than women to desire nontraditional Navy ratings. The differences in these two proportions are significant at the .01 level. Though the men and women in this sample have all made the occupational choice to join the Navy, their preferences for specific occupations in the Navy still differ.

A comparison of propensity for nontraditional civilian occupations between male and female Navy enlistees is displayed in Table 8. Navy men are more likely than Navy women to choose work in the male-dominated civilian occupational fields. The difference in these two proportions is significant at the .01 level. The women in the NRS sample have all made the occupational choice to join the Navy, but their preferences for future civilian jobs differ from men.

TABLE 8.

PROPORTION OF NAVY ENLISTEES
DESIRING NONTRADITIONAL CIVILIAN OCCUPATIONS
BY GENDER

GENDER	PERCENT NONTRADITIONAL
FEMALES	41.3%
MALES	70.3

Source: NRS

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2. Descriptive Statistics

This subsection illustrates the explanatory variables and their means for the multivariate models used later. The expected signs of the explanatory variables in each estimation are then hypothesized. The variables discussed pertain to the two models using NRS data.

Table 9 displays the explanatory variables for the occupational choice models with NTRADMIL and NTRADCIV as the dependent variables. Data from the NRS are used in these two models. The descriptive statistics indicate that the sample is made up predominantly of white men. The mean AFQT score of 63.8 percent indicates that the average enlistee in the sample comes from the upper three mental categories. The data also indicate that 75 percent of the enlistees in this sample consider the opportunity to receive training in a highly technical field an important enlistment motive. Finally, the data show that the majority of enlistees in the sample are enlisted in programs with guaranteed follow-on schooling (ASCHOOL, YO6).

Since nontraditional female choices are the primary concern of this thesis, signs for the explanatory variables in the multivariate model are hypothesized for women only. Among the personal demographics variables, it is hypothesized that black, hispanic, and other race will have positive effects on nontraditional choice. Minority women are historically

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TABLE 9.
DESCRIPTIVE STATISTICS FOR VARIABLES IN
OCCUPATIONAL CHOICE MODELS

EXPLANATORY VARIABLES[a]	MEAN	STANDARD DEVIATION
AFQT (test score)	63.830	19.842
BLACK	0.165	0.371
HISPANIC	0.084	0.278
OTHER RACE	0.004	0.070
TECH	0.750	0.432
SCHOOL	0.136	0.343
LEAD	0.013	0.115
MARRY	0.118	0.323
PROMOTE	0.639	0.480
RESERVE	0.175	0.380
ASCHOOL	0.379	0.485
YO6	0.319	0.466

Source: NRS

[a]In percent, unless otherwise indicated.

inclined to take advantage of nontraditional opportunities such as joining the military (Waite, and Berryman, 1985).

Among the measures of ability, AFQT score is hypothesized to have a positive effect on nontraditional choice. Women with greater ability are expected to want nontraditional jobs, which tend to be higher-paying. "Navy program enlisted for" signals how much commitment a woman is willing to make to the labor force. Those who enlist in a Navy program with a short active duty obligation and a reserve component (RESERVE) are signaling their intention to change their work status in the future. It is hypothesized that reserve-oriented programs will have a negative effect on nontraditional choice. It is hypothesized that a four year program with guaranteed follow-on schooling has a positive impact on nontraditional choice (ASCHOOL). It is also hypothesized that a six year program, usually indicative of high ability, will also have a positive effect on nontraditional choice (YO6). The omitted condition is "other reason for enlisting" (OTHER).

Enlistment motives give clues to what a woman considers important in the world of work. It is hypothesized that those women who consider "high-tech training" an important enlistment motive will be more likely to choose nontraditional jobs (TECH). It is also believed that "Navy career" as an enlistment motive will have a positive effect on nontraditional choice (PROMOTE). "Leadership opportunity" as

an enlistment motive is hypothesized to have a positive impact on nontraditional choice (LEAD). "Money for school" (SCHOOL) or "to support dependents" (SUPPORT) as enlistment motives should have a negative impact on nontraditional choices. The two latter enlistment motives signal desires to leave the labor force, indicators that a traditional choice better fits the respondent's future plans.

3. Multivariate Analysis

Binary logit models are estimated by maximum likelihood techniques using propensity for a nontraditional Navy rating (NTRADMIL) and propensity for a nontraditional civilian occupation (NTRADCIV) as dependent variables. Each model is estimated for all males and females in the NRS sample. Any observation with missing or unreadable variables is deleted from the sample. This subsection presents the overall results for the two NRS models.

The tables in this subsection provide the signs and magnitudes of the estimated coefficients for the binary logit models. For each nontraditional choice, results are provided separately for females and males.

Table 10 displays the binary logit estimate using a female dummy variable in the nontraditional Navy rating model. The large negative effect of FEMALE indicates that women are significantly less likely than men to desire nontraditional

Navy ratings. A comparison of separate female and male estimates may indicate reasons for this difference.

TABLE 10.

LOGIT ESTIMATE OF FEMALE DUMMY VARIABLE IN NONTRADITIONAL NAVY RATING MODEL

COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
-1.0548	.0001

Source: NRS

Table 11 displays the binary logit estimates for the nontraditional Navy rating model for women, and Table 12 provides separate estimates for men. In the female sample, only two explanatory variables (TECH and RESERVE) have significant effects (.10 level or better) on propensity for a nontraditional Navy rating. The signs for these two significant variables are as hypothesized. Among the enlistment motive variables, women who enlist for high-tech training (TECH) are more likely to prefer nontraditional ratings than those who enlist for other reasons. This finding is as expected. Among the labor force commitment variables, women who enlisted in a program with a short active duty commitment and a reserve component are less likely to choose nontraditional ratings than those who enlisted in any other program. This finding was also as expected.

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TABLE 11.
LOGIT ESTIMATES OF THE DETERMINANTS OF
NONTRADITIONAL NAVY RATING CHOICE FOR WOMEN

EXPLANATORY VARIABLES	COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
AFQT	0.096	0.831
BLACK	-0.124	0.607
HISPANIC	0.172	0.513
OTHER RACE	0.699	0.440
TECH	0.592*	0.001
SCHOOL	-0.220	0.321
LEAD	-0.595	0.527
MARRY	-0.246	0.441
PROMOTE	-0.140	0.457
RESERVE	-0.628*	0.044
ASCHOOL	-0.256	0.305
YO6	-0.483	0.162
INTERCEPT	-0.096	0.831

CONCORDANCE RATIO[1]	0.603	
CHI-SQUARE[2]	19.447	
SAMPLE SIZE	589	

[1] Is a measure of the predictive ability of the model.
[2] Likelihood ratio chi-square is a measure of the model's overall fit.
* Significant at the .10 level or better.

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The likelihood ratio chi-square test statistic of 19.447 tests the joint significance of the explanatory variables in the model. In this case they are significant at only the .078 level. The concordance ratio provides a measure of a model's predictive ability. In this case the ratio is .603. This model does not seem to fit the data well. Background factors and variables indicating a woman's home and labor force preferences are not available in this model, probably causing specification bias.

In the male sample, shown in Table 12, six of the explanatory variables have significant effects (at the .10 level or better) on the propensity for nontraditional Navy ratings. The male and female equations both show the positive effect of a desire for high-tech training (TECH) on nontraditional Navy rating choice. The male equation also shows a positive effect for six year enlistment (YO6) on nontraditional rating choice. The male equation shows a negative effect for BLACK, SCHOOL, MARRY and PROMOTE on nontraditional Navy rating choice. These findings indicate that the determinants of nontraditional rating choice are more varied for men than for women. This may be caused, in part, by the larger variances in ability among male enlistees than among female enlistees.

Table 13 displays the binary logit estimate for a female dummy variable in the nontraditional civilian occupation model. The large negative effect of FEMALE

TABLE 12.
LOGIT ESTIMATES OF THE DETERMINANTS OF
NONTRADITIONAL NAVY RATING CHOICE FOR MEN

EXPLANATORY VARIABLES	COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
AFQT	-0.002	0.402
BLACK	-0.568*	0.0001
HISPANIC	-0.068	0.744
OTHER RACE	-0.127	0.880
TECH	0.584*	0.0001
SCHOOL	-0.651*	0.0001
LEAD	0.128	0.800
MARRY	-0.498*	0.001
PROMOTE	-0.187*	0.106
RESERVE	0.191	0.235
ASCHOOL	-0.216	0.131
YO6	1.233*	0.0001
INTERCEPT	1.158	0.0001
CONCORDANCE RATIO[1]	0.707	
CHI-SQUARE[2]	202.643	
SAMPLE SIZE	2238	

[1] Is a measure of the predictive ability of the model.
[2] Likelihood ratio chi-square is a measure of the model's overall fit.
* Significant at the .10 level or better.

indicates that female Navy recruits are significantly less likely than male recruits to desire nontraditional civilian occupations. A comparison of separate female and male estimates may indicate reasons for this difference.

TABLE 13.

LOGIT ESTIMATE OF FEMALE DUMMY VARIABLE IN NONTRADITIONAL CIVILIAN OCCUPATION MODEL

COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
-.9908	.0001

Source: NRS

Table 14 presents the binary logit estimates for the nontraditional civilian occupational choice model for women, and Table 15 presents estimates for men. In the female sample, five explanatory variables have significant effects (at the .10 level or better) on the propensity for a nontraditional civilian occupation. Women with greater ability, as measured by the Armed Forces Qualification Test (AFQT), are more likely to desire nontraditional occupations. This finding is as hypothesized. When compared to whites, black women (BLACK) are less likely to desire nontraditional civilian jobs.

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TABLE 14.
LOGIT ESTIMATES OF THE DETERMINANTS OF
NONTRADITIONAL CIVILIAN OCCUPATIONAL CHOICE FOR NAVY WOMEN

EXPLANATORY VARIABLES	COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
AFQT	0.013*	0.021
BLACK	-0.411*	0.091
HISPANIC	0.358	0.187
OTHER RACE	-0.716	0.422
TECH	0.732*	0.0003
SCHOOL	-0.507*	0.038
LEAD	-1.202	0.302
MARRY	0.467	0.156
PROMOTE	0.134	0.500
RESERVE	-0.040	0.902
ASCHOOL	-0.049	0.849
YO6	1.033*	0.004
INTERCEPT	-1.791	0.0002
CONCORDANCE RATIO[1]	0.681	
CHI-SQUARE[2]	58.264	
SAMPLE SIZE	589	

[1] Is a measure of the predictive ability of the model.
[2] Likelihood ratio chi-square is a measure of the model's overall fit.
* Significant at the .10 level or better.

Among the enlistment motive variables, women who enlist for high-tech training (TECH) are more likely to prefer nontraditional civilian jobs than those who enlist for other reasons. Women who enlist in order to acquire money for college (SCHOOL) are less likely to desire nontraditional occupations than those who enlist for other reasons. Among the labor force commitment variables, women who enlist in highly technical Navy programs with a six year active duty obligation (YO6) are more likely to desire nontraditional occupations than those who enlisted for any other reason.

Of the five significant variables in this model, all have signs as hypothesized, except BLACK. This may be explained by other background variables common to black women that are omitted from this model. As for the overall fit of this model, the likelihood ratio chi-square statistic of 58.264 is significant at the .0001 level. The concordance ratio of .681 indicates that this model does have some predictive power. Of course, background factors are also missing from this model, indicating that a better fit could be achieved with an expanded model.

In the male sample, shown in Table 15, five of the explanatory variables are also significant at the .10 level or better. These findings mirror the female sample, except for the opposite sign on AFQT. Men with greater ability, as measured by the AFQT, are less likely to desire nontraditional civilian occupations. Vertical sex segregation may be the

TABLE 15.
LOGIT ESTIMATES OF THE DETERMINANTS OF
NONTRADITIONAL CIVILIAN OCCUPATIONAL CHOICE FOR NAVY MEN

EXPLANATORY VARIABLES	COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
AFQT	-0.005*	0.066
BLACK	-0.437*	0.001
HISPANIC	-0.264*	0.142
OTHER RACE	-0.866	0.240
TECH	0.698*	0.0001
SCHOOL	-0.702*	0.0001
LEAD	0.091	0.826
MARRY	0.101	0.490
PROMOTE	-0.060	0.555
RESERVE	-0.041	0.781
ASCHOOL	-0.078	0.567
YO6	0.604*	0.0002
INTERCEPT	0.744	0.001
CONCORDANCE RATIO[1]	0.647	
CHI-SQUARE[2]	143.422	
SAMPLE SIZE	1238	

[1] Is a measure of the predictive ability of the model.
[2] Likelihood ratio chi-square is a measure of the model's overall fit.
* Significant at the .10 level or better.

cause of this negative effect. Even in traditionally female occupations, men dominate the higher paying managerial positions. Men with greater ability may desire management positions in traditional female occupational fields.

IV. NLSY DATA, METHODOLOGY, AND RESULTS

This chapter discusses the data set used to analyze the propensity for nontraditional occupations among 17 to 20 year old women. The first section describes the National Longitudinal Survey (NLSY) data set in detail. The second section outlines the methodologies employed to differentiate traditional from nontraditional occupations and models the determinants of occupational choice for men and women. The third section presents the results of the multivariate analyses of the determinants of nontraditional occupational choice.

A. NATIONAL LONGITUDINAL SURVEY OF YOUTH DATA

The second source of data used in this analysis is the National Longitudinal Survey of Youth (NLSY). The NLSY is a national sample of young people in the U.S. population who were ages 14 to 21 in 1979. Respondents in the survey were residents of the United States, with the exception of active duty military personnel stationed overseas. The NLSY excludes those permanently institutionalized. The portion of the NLSY data used in this analysis is limited to those respondents ages 17 to 20 years old at either the 1979 baseline interview or the 1982 follow-up interview. The sample used in this thesis consists of 4,624 men and women. The NLSY data also

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includes 935 respondents who have some military experience.

In the baseline and follow-up interviews of the NLSY, respondents are asked hundreds of questions concerning their family background, family attitudes towards work, educational expectations, and work expectations. The question most important to this analysis asks each respondent, "What is your desired occupation at age 35?" Answers to this question should accurately represent propensity for traditional or nontraditional civilian occupations.

Table 15 displays seven broad categories of variables available in the NLSY. These variables are used in the analysis in Section C below. The first broad category of NLSY data concerns a respondent's occupational preferences. The NLSY asks each respondent to state his or her desired occupation at age 35. Responses are coded using the 1970 census occupational coding system. In this thesis responses are further categorized as either "traditional" or "nontraditional" female occupational choices. The likelihood of a 17 to 20 year old choosing a nontraditional civilian occupation is the dependent variable for the first portion of the NLSY analysis in this thesis. The methodology employed to code each civilian occupational grouping is discussed below. The 1970 census occupational oupings and their coding are listed in Appendix A.

The Military Service variable denotes those 17 to 20 year old youths who were either in the military when surveyed or have

TABLE 15. BROAD CATEGORIES OF VARIABLES FROM THE NLSY.

OCCUPATIONAL PREFERENCES

--Desired Civilian Occupation at Age 35
--Military Service
--Military Occupation

HOME AND LABOR FORCE PREFERENCES

--Early Marriage
--Wants Family at Age 35
--Wants No Children

ABILITY MEASURES

--Armed Forces Qualification Test Scores
--Armed Services Vocational Aptitude Battery Scores

FAMILY ATTITUDES TOWARDS THE LABOR FORCE

--Family attitude toward respondent being: a Carpenter,
  an Engineer
--Family attitude toward respondent: Not Attending
  College, Not Having Children, Delaying Starting a Family

PERSONAL DEMOGRAPHICS

--Gender, Racial/Ethnic Group, Region, Urban/Rural

EDUCATION

--High School Non-Graduate, High School Graduate,
  Attending College

ECONOMIC INDICATORS

--Mother's Education, Area Unemployment Rate

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been in the military. The likelihood of a 17 to 20 year old

having entered the military is the dependent variable for the

second portion of the NLSY analysis.

The Military Occupation variable denotes the one-digit DoD occupational groupings in which respondents with military experience are employed. These occupations are listed in Appendix D. The ten DoD military occupational groups are further classified "traditional" or "nontraditional" female occupational choices. Assigned military occupation differs from desired civilian occupation because the former does not reflect propensity. Military occupations are assigned based on ability, needs of the service, and to some extent, the personal preferences of the enlistee. The likelihood of a 17 to 20 year old with military experience being assigned a nontraditional military occupation is the dependent variable for the third portion of the NLSY analysis in this thesis.

The second broad category of NLSY variables includes measures that reflect home and labor force preferences. The "Early Marriage" variable denotes those respondents who desire marriage prior to age 25. The "Wants Family at Age 35" variable denotes those respondents whose preferred labor force activity at age 35 is marriage and family. The "Wants No Children" variable represents those respondents who have no children and do not plan to ever have any.

The third broad category of NLSY variables reflects ability. The Armed Forces Qualification Test (AFQT) score is used as a general measure of a respondent's mental ability. AFQT score is computed from subtests of the Armed Services Vocational Aptitude Battery (ASVAB). Three separate ASVAB

scores are also available in the data. They include: Verbal and Quantitative Skills, Mechanical Knowledge, and Administrative Skills.

A respondent's family's attitude towards the labor force is measured in the fourth broad category of NLSY variables. Respondent's are asked whether their family would approve of their being a carpenter or an engineer. Respondents are also asked if their family would approve of them not going to college, not having children, or delaying having a family. Responses to these questions indicate whether traditional or nontraditional work values are present in the home.

Demographics comprise the fifth broad category of NLSY variables. There are males and females in the sample. Racial/ethnic group is broken into two categories: White and Nonwhite. The location of a respondent's home is also a variable of interest. The following regions of the United States are differentiated in the data: Northeast, North Central, South, and West. Whether a respondent lives in an Urban, or Rural area is also of importance.

The educational attainment of respondents makes up the sixth broad category of NLSY variables. Education is broken down into the following three groupings: non-high school graduate, high school graduate, and attending college.

Economic indicators make up the seventh broad category of NLSY variables. The respondent's mother's education is a generally accepted measure of socioeconomic status. The

unemployment rate in the respondent's hometown can be used to
infer the relative difficulty a respondent may have in finding
a job.

B. NATIONAL LONGITUDINAL SURVEY OF YOUTH METHODOLOGY

The National Longitudinal Survey of Youth (NLSY) is used
in this thesis to model the determinants of nontraditional
occupational choice for 17 to 20 year old women. This section
describes the modeling methodologies used to: (1) estimate the
determinants of a nontraditional occupational choice; (2)
estimate the determinants of entering the military; and (3)
estimate the determinants of being assigned a nontraditional
military occupation.

The NLSY asks respondents to state their desired
occupation at age 35. Responses are coded using the 1970
census occupational coding system. Using Waite and Berryman's
(1985) methodology, any civilian occupation with a work force
less than or equal to 25 percent female is considered
nontraditional for women. These male-dominated occupations
are coded "nontraditional," and all others are coded
"traditional." The proportion of females in the work force
for each occupation was determined using census data for the
year 1979 (U.S. Census Bureau, 1980). The census occupational
groups and their subsequent coding are shown in Appendix B.

The NLSY sample contains some respondents who are either
serving in the military or have served in the military. Each

respondent with military experience discloses which DoD occupational group he or she is working in. These ten DoD occupational groupings are coded "traditional" or "nontraditional" female occupational choices and listed in Appendix D. The military occupations considered traditional for women by Thomas (1982) are located in four (of the 10) DoD occupational groups. Any military job in one of these four groups is coded "traditional." All other DoD jobs are coded "nontraditional." Assigned military occupation differs from desired civilian occupation because assigned military occupation does not reflect propensity. Military occupations are assigned based on ability, needs of the service, and to some extent, the personal preferences of the enlistee.

Table 16 displays the methodologies for three models of the determinants of nontraditional occupational choice using non-linear logit models. The models' dependent variables, NONTRAD, MIL, and NTRADMIL, are binomial. The dependent variables are defined in this manner because the determinants of nontraditional choices are most relevant to Navy manpower planners. The maximum likelihood technique will be used in these estimations for modeling binomial dependent variables (Studenmund, 1992).

TABLE 16. MODELING METHODOLOGIES USING NLSY DATA.

Three logit models of nontraditional occupational choice are estimated with maximum likelihood techniques:

1. **NONTRAD** = f (LABOR PREFS, ABILITY, ATTITUDES, DEMOG, EDUCATION)

2. **MIL** = f (LABOR PREFS, ABILITY, DEMOG, EDUCATION, ECONOMICS, OCC PREFS)

3. **NTRADMIL** = f (LABOR PREFS, ABILITY, DEMOG, EDUCATION, OCC PREFS)

Where,

NONTRAD = preference for a nontraditional civilian occupation

ATTITUDES = family attitudes towards labor force

MIL = have been in or currently in the military

NTRADMIL = assignment to a nontraditional military occupation

LABOR PREFS = home and labor force pref variables

ABILITY = ability measures

DEMOG = personal demographic variables

EDUCATION = educational attainment variables

ECONOMICS = economic indicator variables

OCC PREFS = choice of civilian occupation

The NONTRAD model will show the determinants of nontraditional occupational choice for youths aged 17 to 20. The MIL model will show the determinants of a decision to enter the military. The NTRADMIL will show the determinants

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of assignment to a nontraditional occupation, given the choice of entering the military.

Waite and Berryman's (1985) analysis of the determinants of nontraditional choice is used as a guide for the specification of the NONTRAD model. Home and labor force preference variables are included in the NONTRAD models as clues to a respondent's expected duration of participation in the labor force. As indicated by Gupta (1993), women who do not expect to leave the labor force and raise children are more likely to choose nontraditional female occupations.

Waite and Berryman use three separate ASVAB test scores in their analysis. This thesis uses the three ASVAB scores along with AFQT score. A respondent's AFQT score is a generally accepted measure of his or her mental ability, while the ASVAB score predicts training success in a specific military occupation. Both measures are used in this analysis to better identify those respondents with the specific abilities needed for nontraditional occupations.

The MIL model will show the determinants of a decision to enter the military. Hosek and Peterson's (1990) estimation of the determinants of enlistment was used as a guide in the specification of this model. Hosek and Peterson's model does not include family attitudes toward the labor force. These variables are also excluded from the MIL model. The area unemployment rate, an economic indicator, is included in the MIL model. This reflects the belief that outside economic

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factors affect the decision to join the military more than they affect other choices modeled in this thesis.

The MIL and NTRADMIL models are intended to model military service and occupational choice as a system. The NTRADMIL model analyzes the determinants of assignment to a nontraditional military occupation, given the choice of entering the military. This model differs from the NONTRAD model, mainly because it does not reflect a respondent's propensity for the occupation assigned. Two other major factors influence assignment to a military occupation: "The needs of the service," and the enlistee's ability. Family attitudes toward the labor force are not used in the NTRADMIL model because the decision to enter the military has already been made. The variables in the broad categories of labor force preference and occupational preference represent the propensity component of military assignment. Ability measures, demographic variables, and education variables represent the ability components of military assignment. There is no suitable proxy for "needs of the service."

C. NATIONAL LONGITUDINAL SURVEY OF YOUTH RESULTS

This section presents the results of analyses conducted using NLSY data. The first subsection shows the frequency distribution of dependent variables, providing an overview of the data. The second subsection includes descriptive statistics for the explanatory variables in the analyses. The

concluding subsection shows the results of the multivariate analyses of the determinants of nontraditional occupational choice for men and women.

1. Frequency Distribution Of Dependent Variables

Table 17 shows a comparison of propensity for nontraditional civilian occupations between 17 to 20 year old male and female civilians in the NLSY sample. Once again, men are more likely than women to desire work in the male-dominated civilian occupational fields. These differences are significant at the .01 level. This is further indication that, among civilian youth, future occupational preferences differ between men and women.

TABLE 17.

PROPORTION OF 17 TO 20 YEAR OLD CIVILIANS DESIRING NONTRADITIONAL CIVILIAN OCCUPATIONS BY GENDER

GENDER	PERCENT NONTRADITIONAL
FEMALES	20.0%
MALES	73.4

Source: NLSY

Table 18 compares the propensity for nontraditional occupations of female civilians and women with military experience in the NLSY sample. As previously demonstrated in Table 8, women who have made a nontraditional choice such as entering the military are more likely than civilian women to choose nontraditional civilian occupations.

TABLE 18.

PROPORTION OF 17 TO 20 YEAR OLD FEMALE CIVILIANS AND 17 TO 20 YEAR OLD FEMALES WITH MILITARY EXPERIENCE DESIRING NONTRADITIONAL CIVILIAN OCCUPATIONS

SAMPLE	PERCENT NONTRADITIONAL
17 TO 20 YEAR OLD CIVILIANS	20.0%
17 TO 20 YEAR OLD WITH MILITARY EXPERIENCE	29.8

Source: NLSY

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2. Descriptive Statistics

This subsection illustrates the explanatory variables and their means for the multivariate models used later. The expected signs of the explanatory variables are then hypothesized. Table 19 displays the explanatory variables and their means for the occupational choice model with NONTRAD as the dependent variable. Data from the NLSY is used in this

TABLE 19.
DESCRIPTIVE STATISTIC FOR VARIABLES IN
NONTRADITIONAL CIVILIAN OCCUPATION MODEL

EXPLANATORY VARIABLES[a]	MEAN	STANDARD DEVIATION
NONWHITE	0.333	0.471
MARRIED	0.081	0.273
MOMED (years)	10.877	3.162
AFQT (test score)	60.895	20.420
ADMIN (test score)	68.851	30.480
VQUANT (test score)	56.585	27.456
MECH (test score)	45.072	21.852
NONGRAD	0.602	0.489
COLLEGE	0.119	0.324
NEAST	0.192	0.394
NCENT	0.251	0.433
SOUTH	0.368	0.482
URBAN	0.784	0.411
EMARR	0.048	0.214
FAM35	0.101	0.302
NOCHILD	0.065	0.247
CARPENTER	0.386	0.487
ENGINEER	0.428	0.494
CHILDLESS	0.184	0.387
NOCOLLEGE	0.151	0.358

Source: NLSY

[a]In percent, unless otherwise indicated.

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analysis. Any respondent with military experience is excluded from this sample. The data indicate that the sample of all nonmilitary respondents is 50 percent female and predominantly white. The sample is predominantly urban, and 60 percent of respondents have not yet graduated from high school. The home and labor force preference variables indicate that a small proportion of respondents desire no children (NOCHILD), early marriage (EMARR), or desire a primary occupation caring for family at age 35 (FAM35). There is also a small proportion of married youth in the sample.

Table 20 displays the explanatory variables and their means for the occupational choice model with MIL as the dependent variable. Data from the NLSY is used in this analysis. The model attempts to identify the determinants of the choice to enter the military among 17 to 20 year old women. The descriptive statistics indicate that the sample is almost evenly divided between men and women. The sample is 32 percent nonwhite, and the majority of the respondents are from urban areas. The data also shows that less than ten percent of the sample want their primary job to be raising a family at age 35 (FAM35). Only six percent of the sample want no children (NOCHILD).

Table 21 displays the explanatory variables and their means for the model with NTRADMIL as the dependent variable. Data from the NLSY is used in this analysis. The sample of

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TABLE 20.
DESCRIPTIVE STATISTICS FOR VARIABLES
IN MILITARY ENLISTMENT MODEL

EXPLANATORY VARIABLES[a]	MEAN	STANDARD DEVIATION
FEMALE	0.478	0.499
NONWHITE	0.329	0.470
MARRIED	0.090	0.286
AFQT (test score)	60.356	20.911
NONGRAD	0.573	0.494
UNEMRATE (home area)	3.100	1.122
NEAST	0.197	0.398
NCENT	0.234	0.423
SOUTH	0.369	0.482
URBAN	0.720	0.448
EMARR	0.046	0.211
FAM35	0.095	0.293
NOCHILD	0.063	0.244
ADMIN (test score)	69.234	30.733
VQUANT (test score)	57.011	27.669
MECH (test score)	45.854	22.411

Source: NLSY

[a]In percent, unless otherwise indicated.

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TABLE 21.
DESCRIPTIVE STATISTICS FOR VARIABLES IN
NONTRADITIONAL MILITARY OCCUPATION MODEL

EXPLANATORY VARIABLES[a]	MEAN	STANDARD DEVIATION
FEMALE	0.304	0.460
NONWHITE	0.333	0.471
MARRIED	0.160	0.367
AFQT (test score)	62.655	21.074
NONGRAD	0.291	0.454
NEAST	0.260	0.439
NCENT	0.077	0.268
SOUTH	0.382	0.486
URBAN	0.086	0.281
FAM35	0.042	0.201
NOCHILD	0.040	0.196
NONTRAD	0.580	0.494
ADMIN (test score)	73.506	32.266
VQUANT (test score)	60.686	28.563
MECH (test score)	51.606	25.516

Source: NLSY

[a]In percent, unless otherwise indicated.

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youths with some military experience is only 30 percent female. The majority of the respondents come from rural areas of the south or west. A majority (58 percent) of the respondents desire nontraditional civilian occupations in the future, indicating that current nontraditional choices may help predict future nontraditional choices.

In the models discussed above, the determinants of women's nontraditional choices are of primary importance. The choices of a nontraditional civilian occupation (NONTRAD), joining the military (MIL), and a nontraditional military occupation (NTRADMIL) are all considered atypical for women. The expected signs of important variables in these models are hypothesized for women only.

Among the labor preference variables, a desire for marriage before age 20 is expected to have a negative effect on nontraditional choice (EMARR). A desire for primary employment at age 35 to be raising a family is also expected to have a negative effect on nontraditional choice (FAM35). A desire for no children is hypothesized to have a positive effect on nontraditional choice (NOCHILD). These labor preference variables may signal a woman's expected labor force participation, and therefore, her propensity for specific jobs. Skills required in the traditional female occupations do not atrophy with intermittent labor force participation, making traditional jobs the expected choice for women who plan a family.

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Among the ability variables, AFQT is expected to have a positive effect on nontraditional choice. Women with greater ability are expected to prefer higher paying, nontraditional jobs. The ASVAB scores for mechanical ability (MECH) and verbal and quantitative ability (VQUANT) are expected to have a positive effect on nontraditional choice, while the score for clerical skills (ADMIN) is expected to have a negative effect on nontraditional choice. In the case of the decision to join the military (MIL), all ability variables are hypothesized to have a positive effect on nontraditional choice.

The family attitude variables may indicate how the work world is viewed by a woman's family. Those families that do not object to a woman entering a male-dominated occupation (CARPENTER, ENGINEER) probably hold nontraditional values. Likewise, families that do not object to a woman postponing college, not having children, or delaying starting a family (NOCOLLEGE, CHILDLESS, DELAY) probably hold nontraditional values. Considering the potential effect of family values on a young person, it is hypothesized that these five variables will have a positive effect on nontraditional choice.

The primary demographic variable in this sample is the racial/ethnic group to which a respondent belongs. It is hypothesized that minority status (NONWHITE) will have a positive effect on nontraditional choice. It is also hypothesized that being married (MARRIED) will have a negative

effect on nontraditional choice for women. Married women are more likely to have children than single women, and thus more likely to plan interrupted labor force participation. The other demographic variables deal with geographic location. It is hypothesized that residence in an urban area (URBAN) will have a positive effect on nontraditional choice.

Among the education variables, not yet graduating from high school (NONGRAD) is expected to have a negative effect on nontraditional choice. This is attributed to the influence of family and peers during the high school years. Attending college (COLLEGE) is hypothesized to have a positive effect on nontraditional choice. .This may be due to higher ability, signaled by the choice to enter college.

Among the economic indicator variables, mother's education in years (MOMED) is expected to have a positive effect on nontraditional choice. This variable is a commonly accepted measure of socioeconomic status. In the case of the decision to join the military, mother's years of education is expected to have a negative effect on nontraditional choice. The option of entering the military is not expected to be attractive to those from higher income families. The other economic indicator is area unemployment rate, used only in the MIL model. Area unemployment rate (UNEMP) is hypothesized to have a positive effect on the desire to enter the military.

The occupational preference variable NONTRAD is used as an explanatory variable in the MIL and NTRADMIL models.

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Since the military may be only one segment of a woman's work career, her future desires may affect whether or not she enters the armed forces and what military occupation she selects. It is hypothesized that NONTRAD will have a positive effect on the decision to enter the military and the choice of a nontraditional military occupation.

3. Multivariate Analysis

Separate binary logit models are estimated by maximum likelihood techniques using three different dependent variables: (a) propensity ror a nontraditional civilian occupation (NONTRAD); (b) propensity to enter the military (MIL); and (c) likelihood of being placed in a nontraditional military occupation (NTRADMIL). Each model is estimated for males and females using data from the NLSY. Any observation with missing variables is deleted from the sample. This subsection presents the overall results for the three NLSY models.

The tables in this subsection provide the signs and magnitudes of the estimated coefficients for the binary logit models. Results for both females and males are presented for each model.

a. Nontraditional Civilian Occupational Choice Model

Table 22 displays the binary logit estimate for a female dummy variable in the nontraditional civilian occupational choice model. The large negative effect of

FEMALE indicates that women are significantly less likely than men to choose nontraditional civilian occupations. Separate estimates of female and male samples may indicate the reasons for this difference.

TABLE 22.

**LOGIT ESTIMATE OF FEMALE DUMMY VARIABLE
IN NONTRADITIONAL CIVILIAN CHOICE MODEL**

COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
-2.1567	.0001

Source: NLSY

Table 23 displays the binary logit estimates for females 'n the nontraditional civilian occupation model; Table 24 displays the estimates for males. In the female sample, ten explanatory variables are significant (at the .10 level or better) in explaining propensity for a nontraditional civilian occupation. Among the home and labor force preference variables, women who desire their primary employment to be raising a family at age 35 (FAM35) are less likely to prefer nontraditional jobs than women who desire work outside the home. This finding is as hypothesized. Women who want to have no children (NOCHILD) are more likely to desire nontraditional jobs than those who want to have children, as expected. As hypothesized, among the ability variables, women with higher

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TABLE 23.
LOGIT ESTIMATES OF THE DETERMINANTS OF NONTRADITIONAL
CIVILIAN OCCUPATIONAL CHOICE FOR 17-20 YEAR OLD WOMEN

EXPLANATORY VARIABLES	COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
NONWHITE	0.088	0.432
MARRIED	-0.248*	0.084
MOMED	0.005	0.595
AFQT	0.038*	0.002
ADMIN	-0.002	0.252
VQUANT	-0.049*	0.018
MECH	0.006	0.254
NONGRAD	-0.065	0.506
COLLEGE	0.017	0.893
NEAST	-0.075	0.552
NCENT	-0.340*	0.006
SOUTH	-0.289*	0.013
URBAN	0.321*	0.003
EMARR	0.078	0.656
FAM35	-0.451*	0.0001
NOCHILD	0.414*	0.006
CARPENTER	0.064	0.595
ENGINEER	0.226*	0.067
CHILDLESS	0.139	0.237
NOCOLLEGE	-0.436*	0.001
INTERCEPT	-5.898	0.0001

CONCORDANCE RATIO[1]	0.641	
CHI-SQUARE[2]	172.712	
SAMPLE SIZE	4008	

[1] Is measure of the predictive ability of the model.
[2] Likelihood ratio chi-square is a measure of the model's overall fit.
* Significant at the .10 level or better.

AFQT scores are more likely to desire nontraditional jobs. However, the higher a woman's verbal and quantitative ASVAB scores, the less likely she is to choose a nontraditional occupation. Among the family attitude variables, women who's families do not object to their entering a male-dominated field, such as engineering (ENGINEER), are more likely to desire nontraditional work than those with disapproving families. Women whose families do not object to their not attending college (NOCOLLEGE) are less likely to desire nontraditional work than those with disapproving families.

Among the demographic variables, women who are married (MARRIED) are less likely to choose nontraditional occupations than those who are single. Women who live in urban areas (URBAN) are more likely to choose nontraditional occupations than those who live in rural regions. When compared to women from the western United States, women from the southern and north central states (SOUTH, NCENT) are less likely to choose nontraditional occupations. The significance of these variables indicates a generally more traditional outlook towards women's work in these two regions.

Of the ten significant explanatory variables in this model, only VQUANT has a sign opposite of that hypothesized. The verbal component of the VQUANT score may indicate talent for traditionally female occupations. Because

of this, the MECH score should be a more effective determinant of solely nontraditional occupational choice.

The likelihood chi-square test statistic of 172.712 tests the joint significance of the explanatory variables in this model. In this case they are significant at the .0001 level. The concordance ratio of .641 indicates the predictive ability of the model. This model does seem to fit the data well.

Table 24 displays the binary logit estimates of the nontraditional civilian occupational choice model for males. Seven explanatory variables are significant (at the .10 level or better) in explaining the determinants of nontraditional occupational choice for men. It is of interest that none of the significant variables have the same signs in both the male and female models. The variables MARRIED and MECH have positive effects on nontraditional civilian occupational choice for men. The variables NONWHITE, ADMIN, COLLEGE, NEAST, and CHILDLESS have negative effects on men's choices of nontraditional civilian occupations. The striking dissimilarities between these two models indicate that in the civilian world, in contrast to the Navy, there are identifiable differences in the determinants of occupational choice between men and women.

TABLE 24.
LOGIT ESTIMATES OF THE DETERMINANTS OF NONTRADITIONAL
CIVILIAN OCCUPATIONAL CHOICE FOR 17-20 YEAR OLD MEN

EXPLANATORY VARIABLES	COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
NONWHITE	-0.183*	0.039
MARRIED	0.467*	0.398
MOMED	0.003	0.669
AFQT	-0.010	0.228
ADMIN	-0.006*	0.007
VQUANT	-0.147	0.328
MECH	0.040*	0.0001
NONGRAD	0.139	0.136
COLLEGE	-0.358*	0.004
NEAST	-0.267*	0.025
NCENT	-0.068	0.553
SOUTH	-0.027	0.806
URBAN	-0.056	0.554
EMARR	-0.001	0.994
FAM35	0.412	0.212
NOCHILD	0.112	0.464
CARPENTER	0.152	0.238
ENGINEER	-0.096	0.449
CHILDLESS	-0.215*	0.050
NOCOLLEGE	0.220	0.062
INTERCEPT	2.254	0.012
CONCORDANCE RATIO[1]	0.657	
CHI-SQUARE[2]	245.211	
SAMPLE SIZE	3989	

[1] Is a measure of the predictive ability of the model.
[2] Likelihood ration chi-square is a measure of the model's overall fit.
* Significant at the .10 level or better.

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b. Military Enlistment Model

Table 25 displays the binary logit estimate for a female dummy variable in the military occupational choice model. The large negative effect of FEMALE indicates that women are significantly less likely than men to enlist in the military. Separate estimates of female and male samples may indicate the reasons for this difference.

TABLE 25.

LOGIT ESTIMATE OF FEMALE DUMMY VARIABLE IN MILITARY ENLISTMENT MODEL

COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
-1.2104	.0001

Source: NLSY

Table 26 displays the binary logit estimates for the military enlistment model for females, and Table 27 shows the estimates for males. In the female equation, six explanatory variables have significant effects (at the .10 level or better) on the decision to enter the military. Only 79 women are used in the model due to missing explanatory variables. Except for the variable UNEMRATE, the signs for the significant variables are as hypothesized. Among the

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TABLE 26.
LOGIT ESTIMATES OF THE DETERMINANTS OF
MILITARY ENLISTMENT FOR 17-20 YEAR OLD WOMEN

EXPLANATORY VARIABLES	COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
NONWHITE	1.184*	0.0001
MARRIED	0.036	0.919
MOMED	-0.034	0.210
AFQT	0.089*	0.020
ADMIN	0.014*	0.031
VQUANT	-0.183*	0.004
MECH	0.071*	0.0001
NONGRAD	-0.222	0.370
UNEMRATE	-0.522*	0.0003
NEAST	-0.278	0.454
NCENT	-0.513	0.145
SOUTH	-0.403	0.192
URBAN	0.282	0.391
FAM35	-0.410	0.238
NOCHILD	-0.225	0.667
INTERCEPT	-12.244	0.001
CONCORDANCE RATIO[1]	0.736	
CHI-SQUARE[2]	70.863	
SAMPLE SIZE	4002	

[1] Is a measure of the predictive ability of the model.
[2] Likelihood ratio chi-square is a measure of the model's
  overall fit.
* Significant at the .10 level or better.

ability variables, the higher a woman's AFQT score, the more likely she is to enter the military. The higher a woman's administrative, verbal and quantitative, and mechanical scores (ADMIN, VQUANT, MECH) on the ASVAB, the more likely she is to enter the military. Among the demographic variables, minority women (NONWHITE) are more likely to enter the military than white women. The unemployment rate is also significant, but its effect is opposite from that hypothesized. The higher the unemployment rate in a woman's home region, the less likely she is to enter the military. This may indicate that women's enlistment decisions are not influenced in the same manner as men's by the outside economy. The military also imposes quotas on female enlistments, which may affect the impact of traditional recruiting indicators, such as the unemployment rate.

The likelihood chi-square test statistic of 70.863 is significant at the .0001 level. The concordance ratio of .750 indicates that the model does have some predictive power. This model does seem to fit the data well.

Table 27 displays the binary logit estimates of the military enlistment model for males. The six variables significant in the female model are also significant in the male model, with signs in the same direction. In the male model the variables NONGRAD, NEAST, and SOUTH also have a positive effect on joining the military. The variable NOCHILD has a negative effect on joining the military only for men.

TABLE 27.
LOGIT ESTIMATES OF THE DETERMINANTS OF
MILITARY ENLISTMENT FOR 17-20 YEAR OLD MEN

EXPLANATORY VARIABLES	COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
NONWHITE	0.558*	0.0001
MARRIED	-0.363	0.226
MOMED	-0.018	0.125
AFQT	0.082*	0.0001
ADMIN	0.006*	0.066
VQUANT	-0.144*	0.0001
MECH	0.024*	0.0001
NONGRAD	0.576*	0.0001
UNEMRATE	-0.162*	0.002
NEAST	0.562*	0.001
NCENT	0.237	0.188
SOUTH	0.520*	0.001
URBAN	-0.068	0.609
FAM35	-0.796	0.185
NOCHILD	-0.709*	0.009
INTERCEPT	-10.654	0.0001
CONCORDANCE RATIO[1]	0.649	
CHI-SQUARE[2]	105.247	
SAMPLE SIZE	4148	

[1] Is a measure of the predictive ability of the model.
[2] Likelihood ratio chi-square is a measure of the model's overall fit.
* Significant at the .10 level or better.

The binary logit estimates are similar for men and women, indicating that men and women who enter the military share more similarities than men and women in the civilian world.

c. Nontraditional Military Occupation Model

Table 28 displays the binary logit estimate for a female dummy variable in the nontraditional military occupation model. The large negative effect of FEMALE indicates that women are significantly less likely than men to choose (or be assigned to) nontraditional military occupations. Separate estimates of female and male samples may indicate the reasons for this difference.

TABLE 28.

**LOGIT ESTIMATE OF FEMALE DUMMY VARIABLE
IN NONTRADITIONAL MILITARY OCCUPATION MODEL**

COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
-1.3502	.0001

Source: NLSY

Tables 29 and 30 display the binary logit estimates for assignment to a nontraditional military occupation, given the decision to enter the military. In the female model, shown in Table 29, only three explanatory variables are

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TABLE 29.
**LOGIT ESTIMATES OF THE DETERMINANTS OF ASSIGNMENT
TO NONTRADITIONAL MILITARY OCCUPATIONS FOR WOMEN**

EXPLANATORY VARIABLES	COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
NONWHITE	-0.801	0.231
MARRIED	-0.318	0.592
AFQT	0.141*	0.151
NONGRAD	0.745	0.341
NEAST	-0.013	0.986
NCENT	0.243	0.812
SOUTH	0.780	0.198
URBAN	-0.400	0.757
FAM35	-1.480	0.191
NOCHILD	0.312	0.715
NONTRAD	-0.007	0.989
ADMIN	0.010	0.478
VQUANT	-0.274*	0.078
MECH	0.084*	0.003
INTERCEPT	-16.306	0.113
CONCORDANCE RATIO[1]	0.779	
CHI-SQUARE[2]	24.962	
SAMPLE SIZE	137	

[1] Is a measure of the predictive ability of the model.
[2] Likelihood ratio chi-square is a measure of the model's overall fit.
* Significant at the .15 level or better.

significant at the .15 level or better. The sample size is larger than that in the military enlistment model. Some explanatory variables in the military enlistment model do not belong in this model, causing fewer observations to be deleted because of missing data. The three significant variables are all measures of ability, indicating that talent outweighs preferences when occupational assignments are being made by the military.

The higher a woman's AFQT score, the more likely she is to be assigned to a nontraditional military occupation. The higher a woman's verbal and quantitative ASVAB score (VQUANT), the less likely she is to be assigned a nontraditional military occupation. This may be caused by a high verbal score signaling a woman's ability to perform well in traditional jobs. The higher a woman's mechanical ASVAB score (MECH), the more likely she is to be assigned to a nontraditional military occupation. These findings indicate that once the decision to enter the military has been made, subsequent job assignment is based heavily on ability and very little on propensity.

The likelihood chi-square test statistic of 24.962 is significant at the .034 level. The concordance ratio of .779 indicates that this model does have some predictive power. Considering the small sample size, this model fits the data fairly well.

Table 30 displays the binary logit estimates of the nontraditional military occupation model for males. Only three variables are significant in the male model. None of these three variables are significant in the female model. Minority men (NONWHITE) are less likely than white men to be assigned nontraditional military occupations. NCENT has a positive effect on assignment to a nontraditional military occupation. Men who desire a nontraditional civilian occupation (NONTRAD) are more likely to be assigned nontraditional military occupations, indicating that men's preferences have some effect on occupational assignment. Once the decision to enter the military has been made, women's subsequent assignments are determined by their ability. This does not appear to be the case for men. This may be caused by the much larger proportion of men in the military. A wider variance in ability exists among men, and this variance may exist in every military occupation.

TABLE 30.
LOGIT ESTIMATES OF THE DETERMINANTS OF ASSIGNMENT
TO NONTRADITIONAL MILITARY OCCUPATIONS FOR MEN

EXPLANATORY VARIABLES	COEFFICIENT ESTIMATE	SIGNIFICANCE LEVEL
NONWHITE	-0.706*	0.021
MARRIED	0.042	0.908
AFQT	-0.016	0.646
NONGRAD	0.158	0.568
NEAST	0.040	0.904
NCENT	0.957*	0.101
SOUTH	0.009	0.974
URBAN	-0.282	0.525
FAM35	0.085	0.947
NOCHILD	0.438	0.601
NONTRAD	0.820*	0.003
ADMIN	-0.008	0.252
VQUANT	0.028	0.636
MECH	0.003	0.787
INTERCEPT	1.988	0.606
CONCORDANCE RATIO[1]	0.668	
CHI-SQUARE[2]	28.041	
SAMPLE SIZE	313	

[1] Is a measure of the predictive ability of the model.
[2] Likelihood ratio chi-square is a measure of the model's overall fit.
* Significant at the .15 level or better.

V. SUMMARY AND RECOMMENDATIONS

The first section summarizes the conclusions that can be drawn from the analysis in this thesis in the context of the research questions posed in Chapter I. The concluding section proposes recommendations and associated policy implications.

A. SUMMARY

Navy women are more likely than young civilian women to choose nontraditional (for women) civilian occupations. Men are more likely than women to desire nontraditional occupations, both in the civilian labor force and in the Navy. There are identifiable determinants of nontraditional occupational choice, and they differ by gender. For women, the major determinants of nontraditional occupational choice are ability, desire for high-tech training, and expected uninterrupted labor force participation. Once a woman has entered the military, ability is the major determinant of her assignment to a nontraditional military occupation. These conclusions are reached in the context of the thesis research question from Chapter I. In the following subsections the research questions are restated and answered.

1. First Research Question

The primary research question for this thesis is: Is there a difference in "desired" occupation between civilian

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women and young female enlistees? An examination of the frequency distribution of the dependent variable (desire for a nontraditional civilian occupation) indicates that there is a difference between these two groups. Table 6 above shows that female Navy enlistees are significantly (at the .01 level) more likely than young civilian women to desire nontraditional civilian occupations. These findings indicate that those women who have made the military an occupational choice have a greater propensity for nontraditional civilian occupations than otherwise comparable civilian women of the same age.

2. Second Research Question

The second research question is: Is there a difference in occupational preferences between male and female civilians and male and female enlisted personnel? An examination of the frequency distribution of the dependent variables (desire for a nontraditional Navy rating, desire for a nontraditional civilian occupation) indicates that there is a difference in occupational preferences between males and females. As shown in Table 7 above, male enlistees are significantly (at the .01 level) more likely than female enlistees to desire nontraditional Navy ratings. Table 8 shows that male Navy enlistees also are significantly (at the .01 level) more likely than female enlistees to desire nontraditional civilian occupations. Table 17 indicates that

17 to 20 year old males are significantly (at the .01 level) more likely than 17 to 20 year old females to desire nontraditional civilian occupations.

The significant negative effects of the female dummy variable in Tables 10, 13, and 18 further indicate the difference in occupational preferences between males and females. Male civilians have a greater propensity for nontraditional civilian occupations than female civilians. Male Navy enlistees have a greater propensity for both nontraditional Navy ratings and civilian occupations than female Navy enlistees.

3. Third Research Question

The third research question is: What factors affect occupational choice and how does the effect of these factors differ across gender and sector? Table 11 shows two significant determinants of nontraditional Navy rating choice for women; "desire for high-tech training" (TECH), and "enlistment in a program with a reserve component" (RESERVE). TECH denotes an enlistee's motive for entering the labor force and is significant for both men and women. RESERVE is a proxy for expected interrupted labor force participation. RESERVE is not significant for men, indicating that men and women may differ in their commitment to work. Those women who desire uninterrupted labor force participation may be motivated to make human capital investments that will allow them to enter

nontraditional female occupations. The behavior of these nontraditional women closely resembles that of men in the labor market.

Table 14 shows determinants of nontraditional civilian occupational choice for Navy women. The most important determinants for women include: Armed Forces Qualification Test score (AFQT), "desire for high-tech training" (TECH), and "enlistment for a six year program" (YO6). AFQT is a measure of an enlistee's ability; the more able a woman is, the more likely she is to desire a nontraditional civilian occupation. AFQT is significant for men, but in the opposite direction. TECH denotes the enlistee's motive for entering the labor force, and is also significant for men. YO6 is a proxy for expected uninterrupted labor force participation. Women who are willing to make a long-term commitment to the military are more likely to desire nontraditional civilian occupations. This parallels the findings of the nontraditional Navy rating choice model. The male and female iterations of this model are very similar, probably an indication of the relative homogeneity of Navy enlistees.

Table 23 shows the determinants of nontraditional civilian occupational choice for 17 to 20 year old civilian women. The most important determinants for women include: Armed Forces Qualification Test score (AFQT), "desire for primary employment raising a family at age 35" (FAM35), and "desire to have no children" (NOCHILD). Ability has a

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positive effect on a young woman's desire for a nontraditional civilian occupation. This parallels the findings in the nontraditional civilian occupational choice model for Navy enlistees. FAM35 has a negative effect on a young woman's desire for a nontraditional civilian occupation. NOCHILD has a positive effect on a young woman's desire for a nontraditional civilian occupation. These indicators of a woman's expected labor force participation parallel the findings of the two occupational choice models for Navy enlistees. AFQT, FAM35 and NOCHILD are not significant determinants of male civilian occupational choice.

Determinants of nontraditional occupational choice are not consistent across gender, but they are consistent between Navy enlistees and young civilians. AFQT is not significant in the nontraditional Navy rating model, but that can be attributed to the uniformly high AFQT scores of female enlistees. Women of high ability, who desire high-tech training and who expect uninterrupted labor force participation, have high propensity for nontraditional Navy or civilian occupations.

4. Fourth Research Question

The fourth research question is: "Is the civilian world a good place to get clues on whether women will want to enter nontraditional occupations in the Navy? Three primary determinants of women's nontraditional occupational choice are

consistent across Navy and civilian models. These three determinants all have positive effects on a woman's choice of a nontraditional Navy or civilian occupation. The determinants are: increased ability, desire for high-tech training, and desire for uninterrupted labor force participation. Because these findings generally hold true in both civilian and military occupational choice models, it appears the civilian world can provide important clues as to whether women will want to enter nontraditional occupations in the Navy.

B. RECOMMENDATIONS

This thesis provides an analysis of the propensity for nontraditional occupations among civilian and Navy women. Determinants of nontraditional occupational choice are consistent between female civilians and Navy enlistees. Apparently, the civilian world can provide clues as to Navy women's behavior in an unconstrained environment. This study provides recommendations intended to assist Navy manpower planners in filling the nontraditional billets currently being opened to women. The following recommendations are based on the overall results of the analysis conducted in this study.

Outreach in high schools, and during the recruiting and enlistment process, may identify those women who possess the traits indicative of propensity for nontraditional occupations. Full information on both traditional and

nontraditional Navy ratings can be provided to women very early in the recruitment process, aiding recruiters in identifying potential enlistees' occupational preferences. Women of high ability, who desire high-tech training and expect uninterrupted labor force participation, can be identified and recruited. By screening for these women with a predisposition for nontraditional ratings, newly opened billets in the male-dominated ratings can continue to be filled.

Focused advertising may also raise the propensity for nontraditional ratings among new Navy recruits. Navy advertisements showing women performing in nontraditional roles (working with equipment instead of people) may attract those women who desire nontraditional Navy ratings. A thorough review of all Navy television, radio, and print advertising should be conducted. Women performing in nontraditional roles should be pushed to the forefront of the recruiting effort, thereby attracting more women into the Navy who envision themselves filling nontraditional jobs.

Further research in women's propensity for nontraditional occupations is also recommended. The data set of Navy enlistees used in this analysis is limited in the amount of background information provided. Detailed ASVAB scores, the enlistee's future plans, and the enlistee's family's attitudes toward the labor force are not included in this analysis. Further analysis with an expanded model of nontraditional Navy

rating choice could identify additional patterns in the determinants of occupational choice between female enlistees and young female civilians. Further longitudinal research should also be conducted to determine whether women's propensity for nontraditional Navy ratings is increasing or decreasing over time.

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APPENDIX A

TRADITIONAL AND NONTRADITIONAL NAVY RATINGS

TRADITIONAL

Cryptologic Technician (CT)
Data Processing Technician (DP)
Disbursing Clerk (DK)
Information Specialist (IO)
Intelligence Specialist (IS)
Legalman (LN)
Mess Management Specialist (MS)
Navy Counselor (NC)
Personnelman (PN)
Postal Clerk (PC)
Radioman (RM)
Religious Program Specialist (RP)
Ship's Serviceman (SH)
Storekeeper (SK)
Yeoman (YN)
Dental Technician (DT)
Hospital Corpsman (HM)

NONTRADITIONAL

Fire Control Technician (FT)
Gunner's Mate (GM)
Mineman (MN)
Missile Technician (MT)
Torpedoman's Mate (TM)
Draftsman (DM)
Lithographer (LI)
Musician (MU)
Builder (BU)
Construction Electrician (CE)
Construction Mechanic (CM)
Engineering Aide (EA)
Equipment Operator (EO)
Steelworker (SW)
Utilitiesman (UT)
Aerographer's Mate (AG)
Aircrew Survival Equipmentman (PR)
Air Traffic Controller (AC)
Aviation Antisubmarine Warfare Operator (AW)
Aviation Antisubmarine Warfare Technician (AX)
Hull Maintenance Technician (HT)
Aviation Boatswain's Mate (AB)

Aviation Electrician's Mate (AE)
Aviation Electronics Technician (AT)
Aviation Fire Control Technician (AQ)
Aviation Machinist's Mate (AD)
Aviation Maintenance Administrationman (AZ)
Aviation Ordnanceman (AO)
Aviation Storekeeper (AK)
Aviation Structural Mechanic (AM)
Aviation Support Equipment Technician (AS)
Photographer's Mate (PH)
Tradesman (TD)
Boiler Technician (BT)
Electrician's Mate (EM)
Engineman (EN)
Gas Turbine Technician (GS)
Interior Communications Electrician (IC)
Machinery Repairman (MR)
Machinist's Mate (MM)
Molder (ML)
Patternmaker (PM)
Boatswain's Mate (BM)
Electronic Warfare Technician (EW)
Master At Arms (MA)
Ocean Systems Technician (OT)
Operations Specialist (OS)
Quartermaster (QM)
Signalman (SM)
Sonar Technician (ST)
Data Systems Technician (DS)
Electronics Technician (ET)
Instrumentman (IM)
Opticalman (OM)
Strategic Weapons System Electronics (SWS)

**TRADITIONAL AND NONTRADITIONAL CIVILIAN OCCUPATIONS
1970 CENSUS OCCUPATIONAL CLASSIFICATION SYSTEM**

PROFESSIONAL, TECHNICAL, AND KINDRED WORKERS

Accountants	Traditional
Architects	Nontraditional
Computer specialists	Traditional
Engineers	Nontraditional
Farm management advisors	Nontraditional
Foresters and conservationists	Nontraditional
Home management advisors	Traditional
Lawyers and judges	Nontraditional
Librarians, archivists, and curators	Traditional
Mathematical specialists	Traditional
Life and physical scientists	Nontraditional
Operations and systems researchers and analysts	Nontraditional
Personnel and labor relations workers	Traditional
Physicians, dentists and related practitioners	Nontraditional
Nurses, dietitians, and therapists	Traditional
Health technologists and technicians	Traditional
Religious workers	Nontraditional
Social scientists	Traditional
Social and recreational workers	Traditional
Teachers, college and university	Traditional
Teachers, except college and university	Traditional
Engineering and science technicians	Nontraditional
Technicians, except health, and engineering and science	Nontraditional
Vocational and educational counselors	Traditional
Writers, artists, and entertainers	Traditional
Research workers, not specified	Traditional

MANAGERS AND ADMINISTRATORS, EXCEPT FARM

Assessors, controllers and treasurers; local public administration	Nontraditional
Bank officers and financial managers	Traditional
Buyers and shippers, farm products	Traditional
Buyers, wholesale and retail trade	Traditional
Credit men	Traditional
Funeral directors	Nontraditional
Health administrators	Traditional
Construction inspectors, public administration	Nontraditional
Inspectors, except construction, public administration	Nontraditional

APPENDIX B (continued)
TRADITIONAL AND NONTRADITIONAL CIVILIAN OCCUPATIONS
1970 CENSUS OCCUPATIONAL CLASSIFICATION SYSTEM

Managers and superintendent building   Traditional
Office managers, n.e.c.   Traditional
Officers, pilots, and pursers; ship   Nontraditional
Officials and administrators; public
     administration, n.e.c.   Traditional
Officials of lodges, societies, and unions   Traditional
Postmasters and mail superintendents   Nontraditional
Purchasing agents and buyers, n.e.c.   Nontraditional
Railroad conductors   Nontraditional
Restaurant, cafeteria, and bar managers   Traditional
Sales managers and department heads, retail
     trade   Traditional
Sales managers, except retail trade   Nontraditional
School administrators, college   Traditional
School administrators, elementary and secondary Traditional
Managers and administrators, n.e.c.   Nontraditional

SALES WORKERS

Advertising agents and salesmen   Traditional
Auctioneers   Nontraditional
Demonstrators   Traditional
Hucksters and peddlers   Traditional
Insurance agents, brokers, and underwriters   Nontraditional
Newsboys   Traditional
Real estate agents and brokers   Traditional
Stock and bond salesmen   Nontraditional
Salesmen and sales clerks, n.e.c.   Traditional

CLERICAL AND UNSKILLED WORKERS

Bank tellers   Traditional
Billing clerks   Traditional
Bookkeepers   Traditional
Cashiers   Traditional
Clerical assistants, social welfare   Traditional
Clerical supervisors, n.e.c.   Traditional
Collectors, bill and account   Traditional
Counter clerks, except food   Traditional
Dispatchers and starters, vehicle   Traditional
Enumerators and interviews   Traditional
Estimators and investigators, n.e.c.   Traditional
Expediters and production controllers   Traditional
File clerks   Traditional
Insurance adjusters, examiners, and
     investigators   Traditional
Library attendants, and assistants   Traditional

Mail carriers, post office	Nontraditional
Mail handlers, except post office	Traditional
Messengers and office boys	Traditional
Meter readers, utilities	Nontraditional
Office machine operators	Traditional
Payroll and timekeeping clerks	Traditional
Postal clerks	Traditional
Proofreaders	Traditional
Real estate appraisers	Traditional
Receptionists	Traditional
Secretaries	Traditional
Shipping and receiving clerks	Nontraditional

CRAFTSMEN AND KINDRED WORKERS

Automobile accessories installers	Nontraditional
Blacksmiths	Nontraditional
Boilermakers	Nontraditional
Bookbinders	Traditional
Brickmasons and stonemasons	Nontraditional
Brickmasons and stonemasons, apprentices	Nontraditional
Bulldozer operators	Nontraditional
Cabinetmakers	Nontraditional
Carpenters	Nontraditional
Carpenter apprentices	Nontraditional
Carpet installers	Nontraditional
Cement and concrete finishers	Nontraditional
Compositors and typesetters	Nontraditional
Printing trades apprentices, except pressmen	Nontraditional
Cranemen, derrickmen, and hoistmen	Nontraditional
Dental laboratory technicians	Traditional
Electricians	Nontraditional
Electrician apprentices	Nontraditional
Electric power linemen and cablemen	Nontraditional
Electrotypers and stereotypers	Nontraditional
Engravers, excluding photoengravers	Nontraditional
Excavating, grading, and road machine operators; excluding bulldozer	Nontraditional
Floor layers, excluding tile setters	Nontraditional
Foremen, n.e.c.	Nontraditional
Forgemen and hammermen	Nontraditional
Furniture and wood finishers	Nontraditional
Furriers	Nontraditional
Glaziers	Nontraditional
Heat treaters, annealers, and temperers	Nontraditional
Inspectors, scalers, and traders; log and number	Nontraditional

Inspectors, n.e.c.	Nontraditional
Jewelers and watchmakers	Nontraditional
Job and die setters, metal	Nontraditional
Locomotive engineers	Nontraditional
Locomotive firemen	Nontraditional
Machinists	Nontraditional
Machinist apprentices	Nontraditional
Mechanics and repairmen	Nontraditional

OPERATIVES, EXCEPT TRANSPORT

Asbestos and insulation workers	Nontraditional
Assemblers	Traditional
Blasters and powdermen	Nontraditional
Bottling and canning operatives	Traditional
Chainmen, rodmen, and axmen; surveying	Nontraditional
Checkers, examiners, and inspectors; manufacturing	Traditional
Clothing ironers and pressers	Traditional
Cutting operatives, n.e.c.	Traditional
Dressmakers and seamstresses, except factory	Traditional
Drillers, earth	Nontraditional
Dry wall installers and lathers	Nontraditional
Dyers	Traditional
Filers, polishers, sanders, and buffers	Traditional
Furnacemen, smeltermen, and pourers	Nontraditional
Garage workers and gas station attendants	Nontraditional
Graders and sorters, manufacturing	Traditional
Produce graders and packers, except factory and farm	Traditional
Heaters, metal	Nontraditional
Laundry and dry cleaning operatives, n.e.c.	Traditional
Meat cutters and butchers, exc. manufacturing	Nontraditional
Meat cutters and butchers, manufacturing	Traditional
Meat wrappers, retail trade	Nontraditional
Metal platers	Nontraditional
Milliners	Nontraditional
Mine operatives, n.e.c.	Nontraditional
Mixing operatives	Nontraditional
Oilers and greasers, excluding auto	Traditional
Packers and wrappers, except meat and product	Traditional
Painters, manufactured articles	Nontraditional
Photographic process workers	Traditional
Precision machine operatives	Nontraditional
Textile operatives	Traditional

TRANSPORT EQUIPMENT OPERATIVES

Boatman and canalmen	Nontraditional
Bus drivers	Traditional
Conductors and motormen, urban rail transit	Nontraditional
Deliverymen and routemen	Nontraditional
Fork lift and tow motor operatives	Nontraditional
Motormen; mine, factory, logging camp, etc.	Nontraditional
Parking attendants	Nontraditional
Railroad brakemen	Nontraditional
Railroad switchmen	Nontraditional
Taxicab drivers and chauffeurs	Nontraditional
Truck drivers	Nontraditional

LABORERS, EXCEPT FARM

Animal caretakers, excluding farm	Traditional
Carpenters' helpers	Nontraditional
Construction laborers, exc. carpenter's helpers	Nontraditional
Fishermen and oystermen	Nontraditional
Freight and material handlers	Nontraditional
Garbage collectors	Nontraditional
Gardeners and groundskeepers, excluding farm	Nontraditional
Longshoremen and stevedores	Nontraditional
Lumbermen, raftsmen, and woodchoppers	Nontraditional
Stock handlers	Nontraditional
Teamsters	Nontraditional
Vehicle washers and equipment cleaners	Nontraditional
Miscellaneous laborers	Nontraditional
Not specified laborers	Nontraditional

FARMERS AND FARM MANAGERS

Farmers (owners and tenants)	Nontraditional
Farm managers	Nontraditional
Farm foremen	Nontraditional
Farm laborers, wage workers	Nontraditional
Farm laborers, unpaid family workers	Traditional
Farm service laborers, self-employed	Nontraditional

SERVICE WORKERS, EXCLUDING PRIVATE HOUSEHOLD

Cleaning service workers	Traditional
Food service workers	Traditional
Health service workers	Traditional
Personal service workers	Traditional
Protective service workers	Nontraditional

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PRIVATE HOUSEHOLD WORKERS

Child care workers, private household	Traditional
Cooks, private household	Traditional
Housekeepers, private household	Traditional
Laundresses, private household	Traditional
Maids and servants, private household	Traditional

APPENDIX C

NEW RECRUIT SURVEY CIVILIAN JOB TYPES

TRADITIONAL	NONTRADITIONAL
01 Sales	05 Electronic Surveillance
02 Office or Clerical	08 Transportation or Delivery
03 Graphics or Media	09 Safety
04 Computer Programming, Software Development	11 Farming, Lumbering or Fishing
06 Food Services	12 Mechanical Repair
07 Cleaning	13 Electrical/Electronic Repair
10 Manufacturing or Production	14 Construction or Utilities Crafts
15 Art, Entertainment, or Recreation	16 Doctor or Dentist
17 Nurse, Pharmacist, or Medical/Dental Technician/ Therapist	19 Engineering or Research
18 Teacher, Counselor, Lawyer, or CPA	

APPENDIX D

TRADITIONAL AND NONTRADITIONAL DoD OCCUPATIONAL GROUPS

TRADITIONAL		NONTRADITIONAL	
02	Communication/Intelligence	00	Infantry
03	Medical/Dental	01	Electronic Equipment
05	Administration	04	Other Technical
08	Service/Supply	06	Electrical/ Mechanical Repair
		07	Craftsmen
		09	Nonoccupation

INITIAL DISTRIBUTION LIST